DOCUMENT RESUME

ED 425 317

CE 077 667

TITLE	Lozier Corporation Workplace Literacy Modules. Alabama Partnership for Training.
INSTITUTION	Alabama State Dept. of Education, Montgomery.
SPONS AGENCY	Office of Vocational and Adult Education (ED), Washington, DC. National Workplace Literacy Program.
PUB DATE	1998-00-00
NOTE	405p.
CONTRACT	V198A40030
PUB TYPE	Guides - Classroom - Teacher (052)
EDRS PRICE	MF01/PC17 Plus Postage.
DESCRIPTORS	Adult Education; Blueprints; Course Content; *Job Skills; Learning Activities; Learning Modules; Lesson Plans; Measurement; Measurement Equipment; *Occupational Safety and Health; *On the Job Training; Quality Control; Safety Education; Teaching Methods; *Workplace Literacy

ABSTRACT

This packet contains 10 learning modules developed for new employees at the Lozier Corporation, as well as a facilitator's manual for teaching the modules. The modules cover the following topics: (1) introduction; (2) Lozier history; (3) personal protective equipment, heat stress and back injuries, and evacuation and housekeeping; (4) bloodborne pathogens, safety awareness; (5) lockout and tagout; (5) quality; (6) inventory transactions; (8) tape measure and fraction applications; (9) measuring instruments; and (10) blueprints. Modules consist of an outline that links specific instructional objectives with learning activities, time needed, resources and materials to use, and an evaluation process. Learning activities include a motivational activity, teaching vocabulary, and instructional activities. Attachments to lesson plans include glossaries, information sheets, worksheets, transparency masters, and exercises. Correlated materials, with answer keys, are included in the facilitators' manual. (KC)

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Lozier Corporation Workplace Literacy Modules

Alabama Partnership for Training

Alabama State Department of Education

Funded by the National Workplace Literacy Program
Contract V19A40030

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Introduction

2 Lozier History

3 PPE
Heat Stress & Back Injuries
Evacuation & Housekeeping

4 Bloodborne Pathogens
Safety Awareness

5 Lockout/Tagout
HazCom/HazMat

6 Quality

7 Inventory Transactions

8 Tape Measure

9 Measuring Instruments

10 Blueprints

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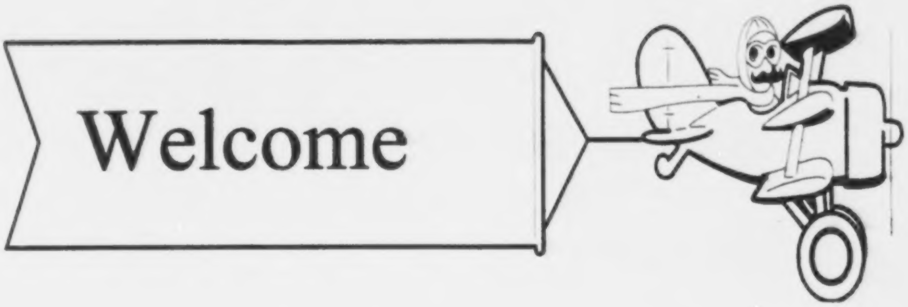

New Hire Orientation

Lozier Corporation

Scottsboro, Alabama

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THE TRAINING PARTNERSHIP

Tips to Help You Get the Greatest Benefits from Training

Training is a PARTNERSHIP between you and your trainer. This relationship implies responsibilities for both parties.

There are a few activities that will help you get the most from your training experience.

Write It Down

Writing things down in your own words helps you to remember more than if you were just listening. This paraphrasing will also help check your understanding of the material.

The written material can serve as a reference for later; it will help you remember what you need to know.

Writing things down may prevent the trainer from having to repeat information.

Writing thins down shows the trainer that you are interested in what is being said.

Ask Questions

Asking questions is one of the most important responsibilities in your training partnership. It will help clarify points for you and others.

Questions help you and your trainer check your level of understanding. They also help the trainer know if the training pace is correct.

When you ask a question, you may be asking something that others are wondering about also.

Contribute

To contribute is different from asking questions. This is an opportunity to share experiences and examples that make the trainer's information clearer and more relative to the everyday world.

Contributing makes you feel that you are a part of the training experience and boosts your self-esteem.

Contributing lets the trainer know you're on track.

NOTE: The following pages have been omitted from the generic curriculum due to the nature of their content. Insert company specific information such as orientation, instructors, schedule of classes, and a welcome icebreaker.

NOTE: This page was omitted because it contained Lozier specific information concerning tuition reimbursement.

NAME: ____________________

PREVIEW

The following is a preview of the units that will be covered in the Lozier Training and Development program. Let's see how much you already know!

Fill in the blanks.

1. Most of the power for lifting should come from the muscles in your ___________.

2. __________ _______ are periodic plant inspections to identify possible safety hazards.

3. The four main product lines of Lozier Scottsboro are: storage shelving, display shelving, wood products, and ________________.

4. A _________ ____________ is a narrow strip of steel marked off in units for measuring.

5. It is critical to check the _____________ ________ before using a precision instrument.

6. Equipment worn by an employee to protect themselves from injury while on the job is called _____________ ______________ __________________.

7. A detailed drawing which provides information as to how the object will look when it is completed is called a ________________.

8. A _________________ is an instrument used to measure or lay out angles on drawings.

9. ______________ and ________________ are two of Lozier Corporation's leading customers.

10. The allowable deviation or change from a standard is called _______________.

11. A customer order that does not meet its scheduled ship date is referred to as _____________.

12. ______________ _____________ is used primarily to merchandise products and is available in an array of colors and sizes.

Read the statements and circle either true or false.

13. Loss of sleep is a factor affecting heat stress. True False

14. A severe weather warning indicates employees should go to the nearest designated shelter. True False

15. Lozier Corporation was incorporated in 1962 and employed approximately 25 people. True False

16. The tolerance for shelf length is 1/32 in. During Betty Ann's quality check , her shelves were off by 2/64 in. These shelves should be rejected. True False

17. You should never place a caliper or micrometer on the top of a running machine. True False

18. Contact lens can be worn on the production floor. True False

19. The title block is always located at the top of blueprints. True False

20. The numerator of a fraction indicates the equal parts into which the unit is divided. True False

21. Salt supplements (salt tablets) are not recommended to prevent heat disorders since too much salt can cause higher body temperature. True False

22. Heat disorders are preventable with proper planning, supervision, and training. True False

23. Only certain people on the floor can effect inventory. True False

24. The recipe for making the items sold by Lozier is called a Bill of Material. True False

25. Inventory transactions are made by the person moving the material. True False

Read the following and circle the best answer.

26. The following are factors preventing back injuries. Circle the letter below that corresponds to the factor that would **not** help in the prevention of back injuries.
    (a) tighten your abdomen
    (b) twist your body when lifting or setting an object down
    (c) face the object squarely and get as close to it as you can
    (d) keep your back straight and upright as possible

27. Listed below are signals an employee would recognize in the event of an emergency. Three of the four signals listed would involve an employee moving to or from a shelter. Circle the letter that corresponds to the signal that does not involve a shelter.
    (a) continuous blast
    (b) all clear
    (c) intermittent blast
    (d) tornado warning

28. Lozier Scottsboro plant was acquired in:
    (a) 1956
    (b) 1968
    (c) 1972
    (d) 1981

29. A denominator:
    (a) indicates the equal number of parts into which the unit is divided
    (b) is a part of a whole quantity
    (c) is a figure or amount obtained by measuring
    (d) is the top number of a fraction

30. The following are all measurement tools. Circle the letter that corresponds to the tool that would be used to measure a 4 ft. piece of shelving.
    (a) caliper
    (b) tape measure
    (c) protractor
    (d) micrometer

31. Hearing protection is required:
    (a) for people who have hearing problems
    (b) when noise in an area bothers you
    (c) only when operating loud machinery
    (d) by all employees working in noisy plant areas

32. The revision number on a blueprint is located:
    - (a) in the notes section of a print
    - (b) in one location on a print
    - (c) in two locations on a print
    - (d) in three locations on a print

33. Confined space is any space that:
    - (a) is large enough that an employee can enter and perform work
    - (b) has limited or restricted means for entry or exit
    - (c) is not designed for continuous employee occupancy
    - (d) all of the above

34. Precision instrument used to measure product dimensions (inside and outside):
    - (a) protractor
    - (b) ruler
    - (c) micrometer
    - (d) caliper

35. In the number 4,056.29 what digit is in the tenths place?
    - (a) 5
    - (b) 6
    - (c) 2
    - (d) 9

36. Who is responsible for transactions of inventory?
    - (a) supervisors and crew leaders
    - (b) supervisors only
    - (c) forklift drivers
    - (d) everyone

37. Nesting is a procedure used to:
    - (a) mark, tag, or sort non-conforming items
    - (b) print labels for product
    - (c) pack product to prevent damage in shipment
    - (d) determine the quantity raw material on hand

38. The time in working days needed from receipt of an acceptable order to process, manufacture, and ship is called:
    - (a) order take off
    - (b) order turn time
    - (c) on hand notice
    - (d) order lead-time

39. An intermittent blast heard throughout the plant means:
    (a) there is a fire in the building
    (b) a thunderstorm warning has been issued
    (c) a tornado warning has been issued
    (d) you need to evacuate the building

40. A continuous blast means:
    (a) all is clear
    (b) a tornado warning has been issued
    (c) to evacuate the building
    (d) to wait for further instructions

41. Billy worked $52\frac{1}{2}$ hours last week at Lozier. If he worked 5 days, about how many hours did he work each day?

42. Margaret lives $\frac{3}{8}$ mile from Lozier. How far does she walk in a five-day week, if she walks to work and back home each day?

43. George had a board measuring $38\frac{3}{4}$ inches long. He cut off $\frac{5}{16}$ of an inch so that the board would fit a shelf. How long was the board after being cut?

44. John is installing a window in Nancy's office that is 30 inches wide. He will need an additional $\frac{3}{4}$ inch space on each side for the rough opening. How wide will the opening for the window need to be?

45. $\frac{7}{10} \div 3\frac{1}{2} =$

46. $\frac{5}{8} \div 5 =$

47. $$\begin{array}{r} 12\frac{2}{3} \\ -\ 9\frac{3}{4} \\ \hline \end{array}$$

48. $$\begin{array}{r} 9\frac{3}{5} \\ -\ \frac{1}{6} \\ \hline \end{array}$$

49. $$\begin{array}{r} 4\frac{9}{16} \\ +\ 3\ \frac{1}{8} \\ \hline \end{array}$$

50. $12\frac{1}{2} \times \frac{2}{5} =$

NAME: ____________________

PREVIEW

Answer Sheet

The following is a preview of the units that will be covered in the Lozier Training and Development program. Let's see how much you already know!

Fill in the blanks.

1. Most of the power for lifting should come from the muscles in your **legs**.
2. **Hazard hunts** are periodic inspections to identify possible safety hazards.
3. The four main product lines of Lozier Scottsboro are: storage shelving, display shelving, wood products, and ______________.
4. A **tape measure** is a narrow strip of steel marked off in units for measuring.
5. It is critical to check the **calibration date** before using a precision instrument.
6. Equipment worn by an employee to protect themselves from injury while on the job is called **personal protective equipment**.
7. A detailed drawing which provides information as to how the object will look when it is completed is called a **blueprint**.
8. A **protractor** is an instrument used to measure or lay out angles on drawings.
9. ______________ and ________________ are two of Lozier Corporation's leading customers.
10. The allowable deviation or change from a standard is called **tolerance**.
11. A customer order that does not meet its scheduled ship date is referred to as **backorder**.
12. **Display Shelving** is used primarily to merchandise products and is available in an array of colors and sizes.

Read the statements and circle either true or false.

13. Loss of sleep is a factor affecting heat stress. True False

14. A severe weather warning indicates employees should go to the nearest designated shelter. True False

15. Lozier Corporation was incorporated in 1962 and employed approximately 25 people. True False

16. The tolerance for shelf length is 1/32 in. During Betty Ann's quality check, her shelves were off by 2/64 in. These shelves should be rejected. True False

17. You should never place a caliper or micrometer on the top of a running machine. True False

18. Contact lens can be worn on the production floor. True False

19. The title block is always located at the top of blueprints. True False

20. The numerator of a fraction indicates the equal parts into which the unit is divided. True False

21. Salt supplements (salt tablets) are not recommended to prevent heat disorders since too much salt can cause higher body temperature. True False

22. Heat disorders are preventable with proper planning, supervision, and training. True False

23. Only certain people on the floor can effect inventory. True False

24. The recipe for making the items sold by Lozier is called a Bill of Material. True False

25. Inventory transactions are made by the person moving the material. True False

Read the following and circle the best answer.

26. The following are factors preventing back injuries. Circle the letter below that corresponds to the factor that would **not** help in the prevention of back injuries.
    (a) tighten your abdomen
    (b) twist your body when lifting or setting an object down
    (c) face the object squarely and get as close to it as you can
    (d) keep your back straight and upright as possible

27. Listed below are signals an employee would recognize in the event of an emergency. Three of the four signals listed would involve an employee moving to or from a shelter. Circle the letter that corresponds to the signal that does not involve a shelter.
    (a) continuous blast
    (b) all clear
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30. The following are all measurement tools. Circle the letter that corresponds to the tool that would be used to measure a 4 ft. piece of shelving.
    (a) caliper
    (b) tape measure
    (c) protractor
    (d) micrometer

31. Hearing protection is required:
    (a) for people who have hearing problems
    (b) when noise in an area bothers you
    (c) only when operating loud machinery
    (d) by all employees working in noisy plant areas

26.	**B**
27.	**A**
28.	**C**
29.	**A**
30.	**B**
31.	**D**

32. The revision number on a blueprint is located:
    (a) in the notes section of a print
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    (c) in two locations on a print
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33. Confined space is any space that:
    (a) is large enough that an employee can enter and perform work
    (b) has limited or restricted means for entry or exit
    (c) is not designed for continuous employee occupancy
    (d) all of the above

34. Precision instrument used to measure product dimensions (inside and outside):
    (a) protractor
    (b) ruler
    (c) micrometer
    (d) caliper

35. In the number 4,056.29 what digit is in the tenths place?
    (a) 5
    (b) 6
    (c) 2
    (d) 9

36. Who is responsible for transactions of inventory?
    (a) supervisors and crew leaders
    (b) supervisors only
    (c) forklift drivers
    (d) everyone

37. Nesting is a procedure used to:
    (a) mark, tag, or sort non-conforming items
    (b) print labels for product
    (c) pack product to prevent
    (d) determine the quantity raw material on hand

38. The time in working days needed from receipt of an acceptable order to process, manufacture, and ship is called:
    (a) order take off
    (b) order turn time
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    (d) order lead time

32.	**D**
33.	**D**
34.	**D**
35.	**C**
36.	**D**
37.	**C**
38.	**D**

39. An intermittent blast heard throughout the plant means:
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    - **(c) a tornado warning has been issued**
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41. Billy worked $52\frac{1}{2}$ hours last week at Lozier. If he worked 5 days, about how many hours did he work each day? $\boxed{10\frac{1}{2}}$

42. Margaret lives $\frac{3}{8}$ mile from Lozier. How far does she walk in a five-day week, if she walks to work and back home each day? $\boxed{3\frac{3}{4}}$

43. George had a board measuring $38\frac{3}{4}$ inches long. He cut off $\frac{5}{16}$ of an inch so that the board would fit a shelf. How long was the board after being cut? $\boxed{38\frac{7}{16}}$

44. John is installing a window in Nancy's office that is 30 inches wide. He will need an additional $\frac{3}{4}$ inch space on each side for the rough opening. How wide will the opening for the window need to be? $\boxed{31\frac{1}{2}}$

45. $\frac{7}{10} \div 3\frac{1}{2} = \boxed{\frac{1}{5}}$

46. $\frac{5}{8} \div 5 = \boxed{\frac{1}{8}}$

47.
$$\begin{array}{r} 12\frac{2}{3} \\ -\ 9\frac{3}{4} \\ \hline \boxed{2\frac{11}{12}} \end{array}$$

48.
$$\begin{array}{r} 9\frac{3}{5} \\ -\ \frac{1}{6} \\ \hline \boxed{9\frac{13}{30}} \end{array}$$

49.
$$\begin{array}{r} 4\frac{9}{16} \\ +\ 3\ \frac{1}{8} \\ \hline \boxed{7\frac{11}{16}} \end{array}$$

50. $12\frac{1}{2} \times \frac{2}{5} = \boxed{5}$

Name: ______________________________

REVIEW

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5. It is critical to check the _____________ ________ before using a precision instrument.

6. Equipment worn by an employee to protect themselves from injury while on the job is called _____________ ______________ __________________.

7. A detailed drawing which provides information as to how the object will look when it is completed is called a ________________.

8. A _________________ is an instrument used to measure or lay out angles on drawings.

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NAME: ____________________

REVIEW

Answer Sheet

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Fill in the blanks.

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3. The four main product lines of Lozier Scottsboro are: storage shelving, display shelving, wood products, and **widespan**.

4. A **tape measure** is a narrow strip of steel marked off in units for measuring.

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8. A **protractor** is an instrument used to measure or lay out angles on drawings.

9. ______________ and ________________ are two of Lozier Corporation's leading customers. **(Autozone, Family Dollar, Rite Aid, Bi Lo, Target, Western Auto, NAPA, and CVS)**

10. The allowable deviation or change from a standard is called **tolerance**.

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    - (d) 1981

29. A denominator:
    - **(a) indicates the equal number of parts into which the unit is divided**
    - (b) is a part of a whole quantity
    - (c) is a figure or amount obtained by measuring
    - (d) is the top number of a fraction

30. The following are all measurement tools. Circle the letter that corresponds to the tool that would be used to measure a 4 ft. piece of shelving.
    - (a) caliper
    - **(b) tape measure**
    - (c) protractor
    - (d) micrometer

31. Hearing protection is required:
    - (a) for people who have hearing problems
    - (b) when noise in an area bothers you
    - (c) only when operating loud machinery
    - **(d) by all employees working in noisy plant areas**

26.	**B**
27.	**A**
28.	**C**
29.	**A**
30.	**B**
31.	**D**

32. The revision number on a blueprint is located:
    - (a) in the notes section of a print
    - (b) in one location on a print
    - (c) in two locations on a print
    - **(d) in three locations on a print**

33. Confined space is any space that:
    - (a) is large enough that an employee can enter and perform work
    - (b) has limited or restricted means for entry or exit
    - (c) is not designed for continuous employee occupancy
    - **(d) all of the above**

34. Precision instrument used to measure product dimensions (inside and outside):
    - (a) protractor
    - (b) ruler
    - (c) micrometer
    - **(d) caliper**

35. In the number 4,056.29 what digit is in the tenths place?
    - (a) 5
    - (b) 6
    - **(c) 2**
    - (d) 9

36. Who is responsible for transactions of inventory?
    - (a) supervisors and crew leaders
    - (b) supervisors only
    - (c) forklift drivers
    - **(d) everyone**

37. Nesting is a procedure used to:
    - (a) mark, tag, or sort non-conforming items
    - (b) print labels for product
    - **(c) pack product to prevent**
    - (d) determine the quantity raw material on hand

38. The time in working days needed from receipt of an acceptable order to process, manufacture, and ship is called:
    - (a) order take off
    - (b) order turn time
    - (c) on hand notice
    - **(d) order lead time**

32.	**D**
33.	**D**
34.	**D**
35.	**C**
36.	**D**
37.	**C**
38.	**D**

39. An intermittent blast heard throughout the plant means:
    - (a) there is a fire in the building
    - (b) a thunderstorm warning has been issued
    - **(c) a tornado warning has been issued**
    - (d) you need to evacuate the building

40. A continuous blast means:
    - (a) all is clear
    - (b) a tornado warning has been issued
    - **(c) to evacuate the building**
    - (d) to wait for further instructions

41. *Billy worked $52\frac{1}{2}$ hours last week at Lozier. If he worked 5 days, about how many* hours did he work each day? $\boxed{10\frac{1}{2}}$

42. Margaret lives $\frac{3}{8}$ mile from Lozier. How far does she walk in a five-day week, if she walks to work and back home each day? $\boxed{3\frac{3}{4}}$

43. George had a board measuring $38\frac{3}{4}$ inches long. He cut off $\frac{5}{16}$ of an inch so that the board would fit a shelf. How long was the board after being cut? $\boxed{38\frac{7}{16}}$

44. John is installing a window in Nancy's office that is 30 inches wide. He will need an additional $\frac{3}{4}$ inch space on each side for the rough opening. How wide will the opening for the window need to be? $\boxed{31\frac{1}{2}}$

45. $\frac{7}{10} \div 3\frac{1}{2} = \boxed{\frac{1}{5}}$

46. $\frac{5}{8} \div 5 = \boxed{\frac{1}{8}}$

47.
$$\begin{array}{r} 12\frac{2}{3} \\ -\ 9\frac{3}{4} \\ \hline \boxed{2\frac{11}{12}} \end{array}$$

48.
$$\begin{array}{r} 9\frac{3}{5} \\ -\ \frac{1}{6} \\ \hline \boxed{9\frac{13}{30}} \end{array}$$

49.
$$\begin{array}{r} 4\frac{9}{16} \\ +\ 3\ \frac{1}{8} \\ \hline \boxed{7\frac{11}{16}} \end{array}$$

50. $12\frac{1}{2}\ \text{x}\ \frac{2}{5} = \boxed{5}$

Introduction to Lozier One

- Lozier History
- Defining our business

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Module: **Introduction to Lozier** **Overall Time 50 min.**
Job Title: **New Hires/General** **Page 1 of 2**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Upon completion of instruction, the learner should be able to list at least four Lozier customers and list Lozier's four main product lines with 100% accuracy.	**Motivational Activity:** Learners will select an item from either a paper bag or a clear plastic bag. Discussion on how many chose the items from the see through bag verses the other bag.	5 min	A brown paper bag filled with miscellaneous items, and a clear plastic bag filled with candy.	Discussion
	Vocabulary: Present key words using overhead transparency and discuss the meaning of each.	5 min	Overhead projector, Attachment A	Participation
	Instructional Activity: Discussion on how starting a new job could be considered the unknown. Instructor will link old knowledge to new knowledge. Discuss the past, present, and future of Lozier.	10 min		
	Guided Practice: Using overhead transparencies, identify and discuss Lozier's customers and product lines.	15 min	Attachments B, C, and D	Participation
	Independent Practice: Learners will complete worksheets independently.	10 min	Attachment E and F	Instructor will check for accuracy
	Evaluation: Check worksheets.	5 min		

LOZIER CORPORATION

Job Title: New Hires/General

Module: Introduction to Lozier

General Instructional Objective: Familiarize each employee with a brief history of Lozier Corporation, its customers, and product lines.

Specific Instructional Objective: The learners should be able to list at least four Lozier customers and list the four main product lines with 100% accuracy.

Motivational Activity: Teacher will place two bags, one being clear plastic, on a table. The plastic bag will be filled with a variety of candy bars; the other bag will be filled with miscellaneous items. Learners will choose an item from either bag. Discussion on how many chose the items from the see through bag versus the other bag showing selection of the known from the unknown.

Vocabulary: Teacher will use overhead transparency to present key words and discuss their meanings (Attachment A)

Instructional Activities: Teacher will lead discussion on how starting a new job can be considered the unknown. Being informed about the history, customers, and main products of the company will help acquaint the new employee with the unknown (new job).

Guided Practice: Teacher will use overhead transparencies to present past, present, and future of Lozier Corporation, and to discuss Lozier customers and product lines (Attachments B, C, D)

Independent Practice: Learners will complete worksheets (Attachments E and F).

Evaluation: Teacher will check completed worksheets.

KEY WORDS

Candor

Capital investment

ERP

Lead time

Integrity

Merchandising systems

Quality

Suppliers

Attachment A

KEY WORDS

Candor – Frankness of opinion; sincerity

Capital investment – Funds expended for additions or improvements to plant or equipment.

ERP – Enterprise Resource Planning is the process by which all business enterprises can be brought into the planning/execution cycles.

Lead time – The time (in working days) needed from receipt of an acceptable order to manufacture and ship, based upon time and the season of the year.

Integrity – Honesty, goodness, firm adherence to values.

Integrated systems – Processes joined together with the ability to communicate and provide input to the business as a whole.

Merchandising systems – A group of interrelated components designed to promote the sale of our customers' products.

Quality – Maintaining proper standards in order to produce a product that meets customers needs, expectations, safety requirements and is cost effective.

Suppliers – The preferred term for Lozier vendors; where we purchase our materials.

Note: Attachments B - D have been omitted from the generic curriculum due to the nature of their content. These attachments pertained to the organization, quality, service, and cost at Lozier Corp. and would not pertain to other companies. Information relating to the particular company should be inserted here.

HOW MUCH YOU REMEMBER?

Choose the letter that best completes the following statements. Write your answer in the blank space.

______1. Lozier purchased the Scottsboro building from a company that manufactured vending machines.

______2. It is necessary that Lozier "does this well" in order to maintain low cost for its customers.

______3. Used primarily behind counters in auto parts stores and in backroom areas.

______4. Used primarily to merchandise products. Most popular Lozier product line.

______5. Sometimes used in "showrooms" and sometimes painted vibrant colors.

______6. Service and products delivered with such reliability that successful retailers overwhelmingly choose Lozier.

______7. Process by which all business processes can be brought into the planning/ execution cycles; a major company project.

______8. Integrity, candor, open-mindedness, work, communication, and family.

______9. Honesty, adherence to values.

______10. High quality, Competitive Products, Friendly, Error-Free Transactions, Responsive Lead Times, "High Value" Prices.

A. Integrity

B. Display shelving

C. Widespan

D. Lozier's Vision

E. 1972

F. ERP

G. Continuous improvement culture

H. Storage shelving

I. Lozier Shared Values

J. Lozier Customer Needs

Attachment E
Answer Sheet

HOW MUCH YOU REMEMBER?

Choose the letter that best completes the following statements. Write your answer in the blank space.

E 1. Lozier purchased the Scottsboro building from a company that manufactured vending machines.

G 2. It is necessary that Lozier "does this well" in order to maintain low cost for its customers.

H 3. Used primarily behind counters in auto parts stores and in backroom areas.

B 4. Used primarily to merchandise products. Most popular Lozier product line.

C 5. Sometimes used in "showrooms" and sometimes painted vibrant colors.

D 6. Service and products delivered with such reliability that successful retailers overwhelmingly choose Lozier.

F 7. Process by which all business processes can be brought into the planning/ execution cycles; a major company project.

I 8. Integrity, candor, open-mindedness, work, communication, and family.

A 9. Honesty, adherence to values.

J 10. High quality, Competitive Products, Friendly, Error-Free Transactions, Responsive Lead Times, "High Value" Prices.

A. Integrity
B. Display shelving
C. Widespan
D. Lozier's Vision
E. 1972
F. ERP
G. Continuous improvement culture
H. Storage shelving
I. Lozier Shared Values
J. Lozier Customer Needs

Attachment F

Important Things to Remember!

Name four customers Scottsboro Lozier supplies with store fixtures.

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

Name the four main product lines discussed in today's lesson.

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

List two things you can do daily in your job to support Lozier's purpose and customer needs.

1. ______________________________

2. ______________________________

Introduction to Lozier Two

- Organizational Chart
- Key Production Mindset

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LOZIER CORPORATION

Job Title: **New Hires/General**

Module: **Introduction to Lozier - Two**

General Instructional Objective: Familiarize new employees with the Scottsboro Plant Organizational Chart and Key Production Mindset.

Specific Instructional Objective: Learners should be able to identify key plant personnel and understand priorities and tolerances in production. Learners should be able to complete evaluation at end of class session with 100% accuracy.

Motivational Activity: Hand out flip chart pages, markers, and index cards with the following information on them:

- Designer: You are to design a prototype for a new car.
- Motivator: You are to motivate everyone working in your company and help facilitate all the groups putting their ideas together.
- Safety: You are to design/add safety features to a new car design.
- Quality: You are to come up with tests or components that would improve the quality of a new car design.
- Cost: You are to come up with a price for a new car design, considering a good profit margin.
- Service: You are to come up with plans to make sure customers get good service from this new car company.

Explain to learners that they are all employees at ***Zozier Car Company.*** They all have important roles in designing a new car line. Once groups have worked together, ask the motivator to help you collect information from all of the groups. Have a volunteer from each group present their ideas. (As each group representative makes his/her presentation, have learners guess what role they have.) On the white board have the designers draw their prototype, the safety team add safety features, the quality team add their quality/tests, the costing team present the cost, and the service team present the service slogan/ideas.

Explain to the learners how products can only be made successfully with input from various departments. As individual groups, the car would not be marketable. Selling a car on safety features alone probably would not be enough to sell a large number of cars. With everyone's ideas, ***Zozier*** cars could be the next Ford or General Motors automobile.

Vocabulary: Teacher will display a list of key words on overhead and discuss meaning of each word.

Instructional Activity: Using the "Organizational Chart Review" (Attachment B and teacher narrative provided), instructor will review the plant organizational chart which will be displayed on an overhead. Learners will be given the opportunity to ask questions as they arise.

Guided Practice: Instructor will assist the learners in making an organization chart. Their chart should include the chain of command in their specific area (Attachment C).

Instructional Activity: Using the chart "A Key Production Mindset" (Attachment D), instructor will discuss with learners Lozier's order of priority and ranges of flexibility and tolerance as related to its employees, product, and customers. The means by which Lozier measures these areas will also be discussed. Explain to learners the usefulness of line graphs and how to read them (Attachment E). Using overhead of line graphs, show how measurements are charted on graphs.

Independent Practice: Learners will also complete a crossword puzzle (Attachment F) as a reinforcement of the key words presented at the beginning of the lesson.

Closure/Evaluation: Learners will discuss the answers to the crossword puzzle.

Attachment A
Transparency

KEY WORDS

AFR

Back orders

Customer complaint

Earned hours

Grievance

Lead times

On time shipments

Overhead

Productivity

Scrap

Turnover

Unscheduled Absenteeism

Welding

Attachment A

KEY WORDS

AFR – Accident frequency rate

Back orders – An order that did not ship on the scheduled ship date. This can be a complete or partial back order.

Customer complaint – A complaint from a customer regarding the company's products, packaging, and/or services or the failure to meet the customer's stated requirements.

Earned hours – The machine time necessary to produce a finished product. (Engineering does time studies to determine the earned hours).

Grievance – A circumstance regarded as just cause for protest.

Lead times – The time between placing a customer order and when the customer receives the order.

On time shipments – Customer receives product order when scheduled.

Overhead – The regular operating expenses of a business, including the costs of rent, utilities, upkeep, and taxes. Overhead does not include labor, materials, or other costs not directly related to producing.

Productivity – Involved in the creation of goods and services to produce wealth or value.

Scrap – Discarded waste material deemed unfit for use in making product.

Turnover – The number of employees that leave Lozier (voluntary or involuntary).

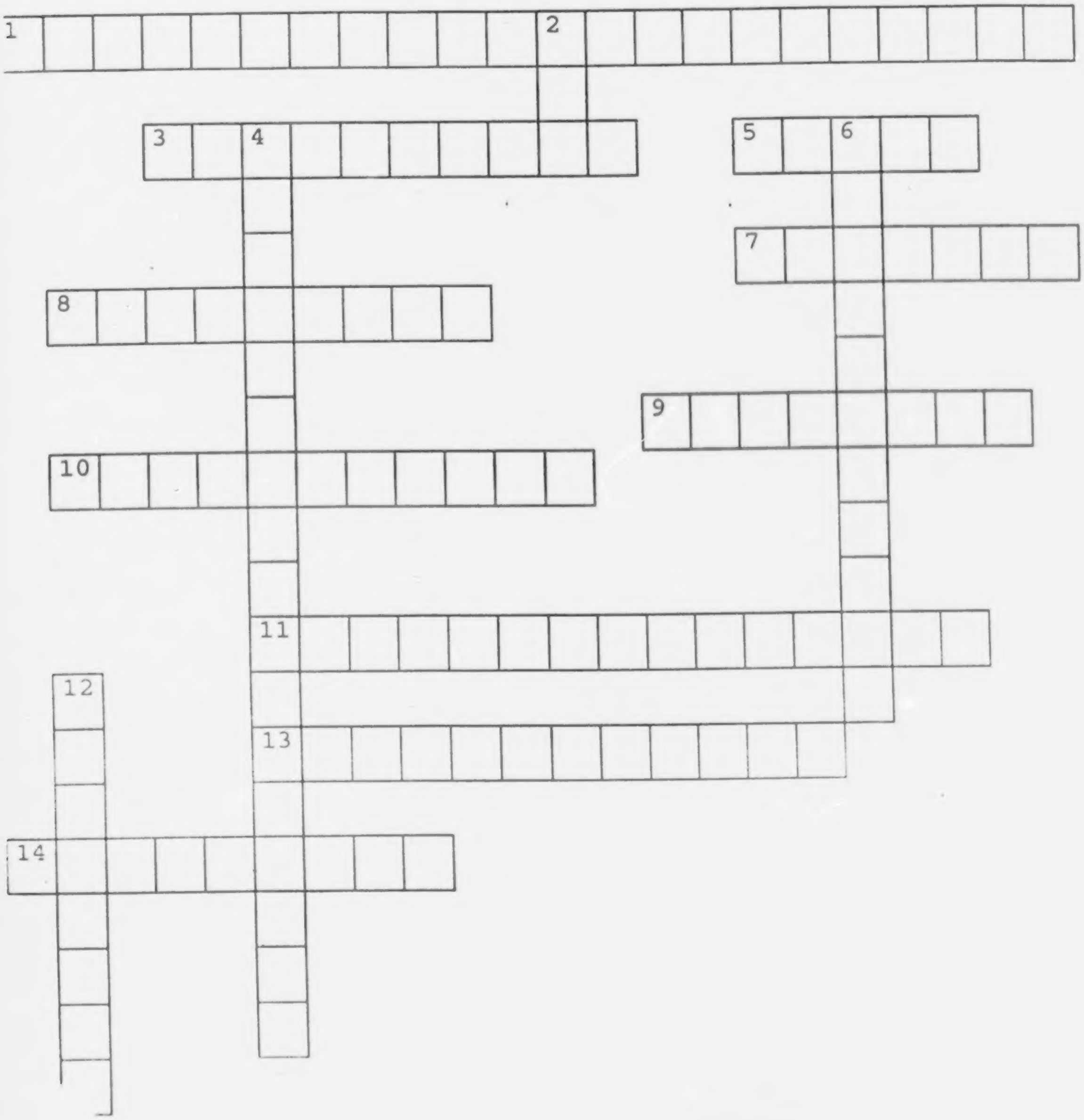
Unscheduled Absenteeism – When an employee is not at work for at least 4 hours. (This does not include vacation, holidays, or any pre-approved time off.)

Welding – The joining of two metal parts by applying heat.

NOTE: Attachment B-E have been omitted from the generic curriculum due to the nature of their content. These attachments contained information concerning the organization, quality, service, and cost at Lozier Corporation and would not pertain to other companies. Information relating to the particular company should be inserted here.

CROSSWORD PUZZLE

Directions: Using the clues provided, work the crossword puzzle.



ACROSS

1. When an employee is not at work for at least 4 hours (This does not include vacation, holidays, or preapproved time off). 2 words
3. An order that did not ship on the scheduled ship date. This can be a complete or partial back order.
5. Discarded waste material deemed unfit for use in making product.
7. The joining of two metal parts by applying heat.
8. The time between placing a customer order and when the customer receives the order. 2 words
9. The number of employees that leave Lozier (voluntary or involuntary).
10. The machine time necessary to produce a finished product. 2 words
11. Customer receives product order when scheduled. 3 words
13. Involved in the creation of goods and services to produce wealth or value.
14. A circumstance regarded as just cause for protest.

DOWN

2. Accident frequency rate
4. Feedback from customer on product and/or services that fail to meet customer requirements. 2 words
6. Process of forming with continuous machine application. 2 words
12. The regular operating expenses of a business.

```
U N S C H E D U L E D A B S E N T E E I S M
                      F
      B A C K O R D E R S     S C R A P
          U                       O
          S                   W E L D I N G
  L E A D T I M E S               L
          O                       F
          M               T U R N O V E R
  E A R N E D H O U R S           R
          R                       M
          C                       I
          O N T I M E S H I P M E N T S
  O       M                       G
  V       P R O D U C T I V I T Y
  E       L
G R I E V A N C E
  H       I
  E       N
  A       T
  D
```

SAFETY ONE

Personal Protective Equipment

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Module: **Personal Protective Equipment, Hearing Conservation, and Confined Space.**

Overall Time 60 min.
Page 1 of 1

Job Title: **General/New Hires**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learner should be able to identify personal protective equipment and distinguish between appropriate and inappropriate means of protection.	**Motivational Activity:** Box containing various PPE will be displayed at front of the room. Instructor will ask for volunteers to identify various items as they are removed from the box.	10 min		Participation
	Vocabulary: Class will discuss words and give examples.	10 min	Attachment A	Participation
	Guided Practice: Instructor will lead discussion on the following topics: Personal protective equipment, Hearing Conservation Program, Appropriate clothing, Confined Spaces, and General Safety Rules.	15 min	Overhead projector, transparencies, Attachments B-G.	Participation
	Independent Practice: Learners will complete true/false questions and crossword puzzle.	15 min	Attachment H and I.	Instructor will check for accuracy
	Evaluation: Instructor will review puzzle answers and emphasize the importance of using appropriate and proper means of Personal protective equipment.	5 min	Crossword puzzle and clues	Participation

LOZIER CORPORATION

Job Title: General/New Hires

Module: Personal Protective Equipment - Safety Level 1

Specific Instructional Objective: Learner should be able to identify Personal Protective Equipment (PPE) and distinguish between appropriate and inappropriate means of protection. Upon completion of lesson, learner should be able to complete evaluation with 100% accuracy.

Motivational Activity: Box containing ear plugs, safety glasses, face shield, welding hood, welding glasses welding apron, gloves (welding, leather, chemical), arm guards, and safety shoes will be on display at the front of the classroom. The instructor will ask learners to identify PPE as each item is removed from the box.

Vocabulary: Class will discuss definitions of key words. Instructor will ask learners to give examples.

Guided Practice: Instructor will lead discussion on the following topics: Personal Protective Equipment, Hearing Conservation Program, Appropriate Clothing, Confined Spaces, and General Safety Rules (Attachments B-G). Overhead provided for reinforcement.

Independent Practice: Learners will complete crossword puzzle (Attachment H) using clues provided. Learners will complete True or False assessment (Attachment I).

Evaluation: Instructor will check answers to True/False questions and review puzzle answers. Instructor will emphasize the importance of using appropriate and proper means of Personal Protective Equipment.

KEY WORDS

Appropriate Clothing - Clothing, shoes, etc. that meet company standards in regard to policy.

OSHA - Occupational **S**afety and **H**ealth **A**dministration - Agency that provides rules governing the workplace to insure the safety of the employee.

Personal Protective Equipment - Equipment worn by an employee to protect themselves from injury while on the job.

Attachment B

Lozier Safety & Health Policy

NOTE: This page was omitted because it contained Lozier specific information concerning the company's safety and health policy.

Personal Protective Equipment Guidelines

The purpose of the Personal Protective Equipment (PPE) program is to ensure the safety of all Lozier employees while engaged in activities that have the chance of causing injury. This policy has been developed to address the personal safety of each Lozier employee and specifically applies to the use and maintenance of PPE for Lozier employees.

Specific PPE (welding hoods, hard hats, eye protection devices, ear plugs, arm guards, gloves, aprons, etc.) is required for certain jobs throughout the plant. Your supervisor will explain what equipment is required for the job you will be performing. Wear the equipment properly and report any defective equipment to your supervisor. Safety glasses must be worn in all areas of the plant.

EYE AND FACE PROTECTION

All employees will wear approved eye protection with side protection when exposed to flying particles or potentially injurious light radiation. Employees wearing prescription glasses must have eyewear with the approved protection factor or they **must** wear approved eye protection over the prescription glasses.

Contact lenses should **not** be worn on the production floor. Heat in the work environment can melt the contact to the eye causing permanent eye damage.

HEAD PROTECTION

All employees will wear protective helmets when working in areas where the potential for injury from falling objects could occur.

FOOT PROTECTION

All employees will wear protective footwear when there is a danger of foot injuries due to falling and rolling objects, objects piercing the sole, or electrical hazards.

HAND PROTECTION

All employees will wear hand protection when exposed to but not limited to: materials or objects that may cause severe cuts, lacerations, or abrasions and chemicals that have the possibility of absorbing through the skin.

PROPER MAINTENANCE OF PPE

This information should be added.

Key Hearing Conservation Terms

AUDIOGRAM - A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency. An audiogram is compared to a baseline audiogram to determine is the individual has suffered any hearing loss.

BASELINE AUDIOGRAM - The audiogram against which future audiograms are compared. This sets the baseline for the individual's hearing.

DECIBEL - The unit of measurement of sound level.

NOISE - Unwanted sound.

NOISE REDUCTION RATING - A method for estimating the reduction in noise provided by hearing protectors.

14-HOUR RULE - Employees need to maintain a 14-hour period prior to any audiometric testing where high levels of non-occupational noise exposure is avoided. Hearing protection can be used as a substitute for the 14 hours without exposure for baseline testing.

Hearing Conservation Program

Too much noise will damage hearing. The problem with hearing loss is that it occurs slowly. The only way to prevent hearing loss is to keep noise levels down or to wear hearing protection whenever working around noisy equipment.

The hearing conservation program applies to all employees who have duties that require them to work in noisy areas. It also applies to any contractors who have to work in noisy areas on the premises.

EMPLOYEE RESPONSIBILITIES:

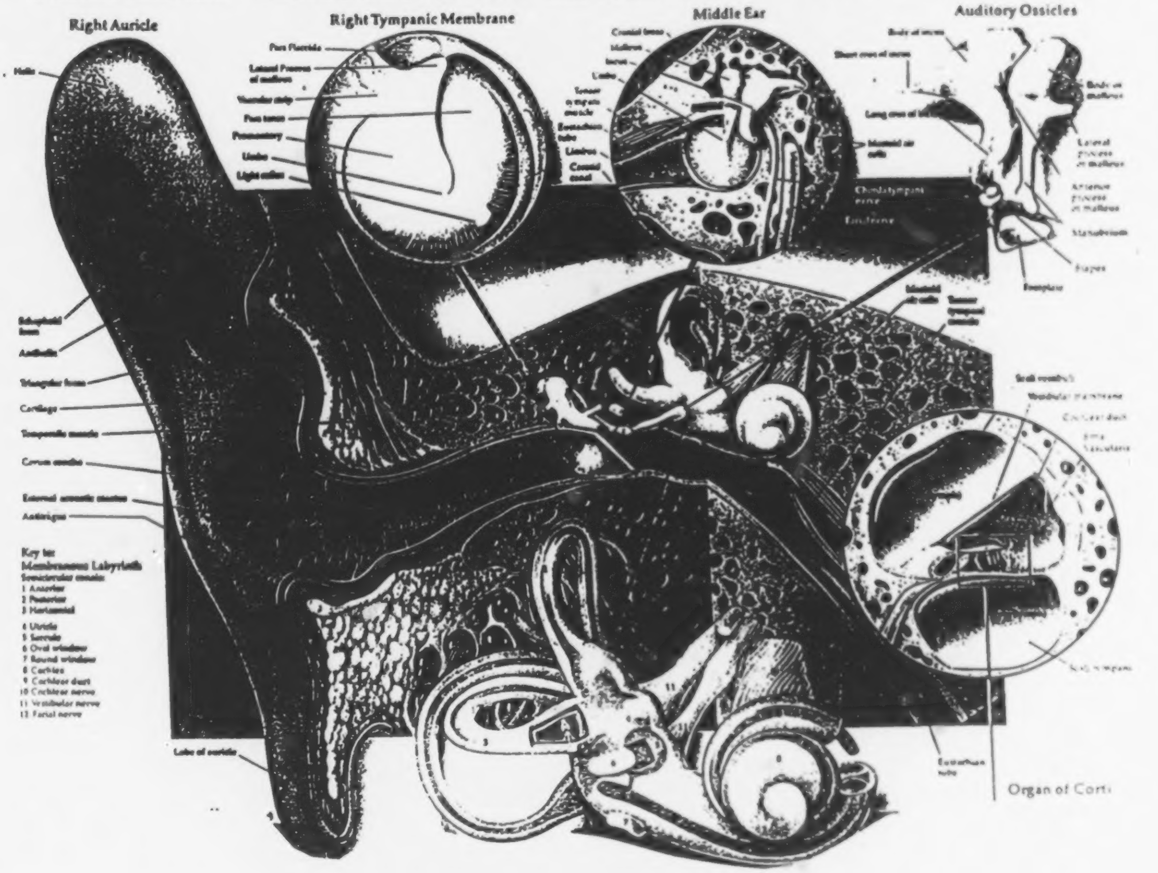
- Wear hearing protection where required.
- Clean and maintain hearing protection.
- Report any areas which they feel are noisy and need to be monitored.

Source: Lozier Safety Procedures

Hearing Conservation

General Structure of the Ear

THE EAR—ORGANS OF HEARING AND BALANCE



Ear Plugs

Disposable

- NRR 33 (Noise Reduction Rating)
- Better protection
- Discard daily

Non-disposable

- NRR varies from 22-27
- Corded or band type
- Lesser protection than disposable
- Can be cleaned with soap and water and reused

Ear muffs

- Bilsom
- NRR 25
- Muffs can be changed out for new clean ones
- They are bulky and often get in the way
- Offer protection for the whole ear from dirt, etc.
- Often are very hot in summer months

Note: For added protection, ear plugs and ear muffs may be used in high noise areas.

Permissible Noise Exposures

Duration per day, hours	Sound Level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

Note: **Plant sound level readings are posted on safety bulletin boards along with Hearing Conservation Standard.**
Employees may observe any noise monitoring that is being done.

Attachment E

Appropriate Clothing

Appropriate clothing for employees must be worn when working in manufacturing areas:

Shirt:

- Long or short sleeves
- No sleeveless shirts or tank tops
- Shirt tails must be kept tucked into the slacks or trousers

Slacks or trousers:

- No skirts, dresses or shorts
- Slacks or trousers should be of denim-like material
- No sweat pants allowed due to flammability and loose fit

Shoes or boots:

Shoes or boots made of durable leather material must be worn at all times when in the plant. Canvas, nylon, plastic, and open-toed shoes offer little or no protection and are not allowed. Steel-toed safety shoes offer the best protection and are highly recommended.

Socks must be worn at all times.

Attachment F

LOZIER CONFINED SPACE AWARENESS TRAINING
OSHA 1910.146

Confined spaces are areas in your department that may pose special hazards to anyone entering them. Some of these hazards may be but are not limited to:

- lack of oxygen
- carbon monoxide
- natural gas
- mechanical hazards
- electrical hazards
- heat hazards

Some confined spaces in your department may be ovens, washers, pits, manholes, tanks, or boilers. Each confined space will be posted at its entrance.

The purpose of this training is to inform you of the potential hazards and the importance of **NEVER** entering into an identified confined space. Entering a confined space refers to any part of your body being placed in the space, even momentarily. Only specially trained employees are allowed to enter confined spaces, and only then after following strict safety guidelines.

I understand that I should never enter an identified confined space unless I have been specially trained beyond this awareness training. I also understand that if I should have any questions now or in the future, I should contact my supervisor or plant safety coordinator.

NAME (print): ______________________
NAME (signature): ______________________
CLOCK NUMBER: ______________________
DATE: ______________________
TRAINER: ______________________

*** THIS WILL SERVE AS DOCUMENTATION OF TRAINING IN ACCORDANCE WITH OSHA REGULATIONS.**

General Safety Rules

A. Do not operate vehicles, machinery or equipment unless you have been properly trained and specifically authorized to do so.
Example: Do not operate a forklift unless you have a license to operate a forklift.

B. Never use defective tools or equipment. Always make a brief check to be sure they are in proper condition and report any defects to your supervisor.

C. Never operate tools, machinery or equipment without properly adjusted guards.

D. Keep your work area neat and orderly. A sloppy work area is unsafe and leads to sloppy work habits.

E. Never walk under a suspended load.
Example: Forklift.

F. Never use compressed air or other gases to blow dust off your skin or clothing.

G. Horseplay has no place in an industrial environment and will not be tolerated.

H. When walking through the parking lots or plant areas remain alert for moving vehicles. Never assume that the operator can see you.

I. Report any unsafe condition to your supervisor.

J. Never block or obstruct fire fighting or emergency equipment or exits.

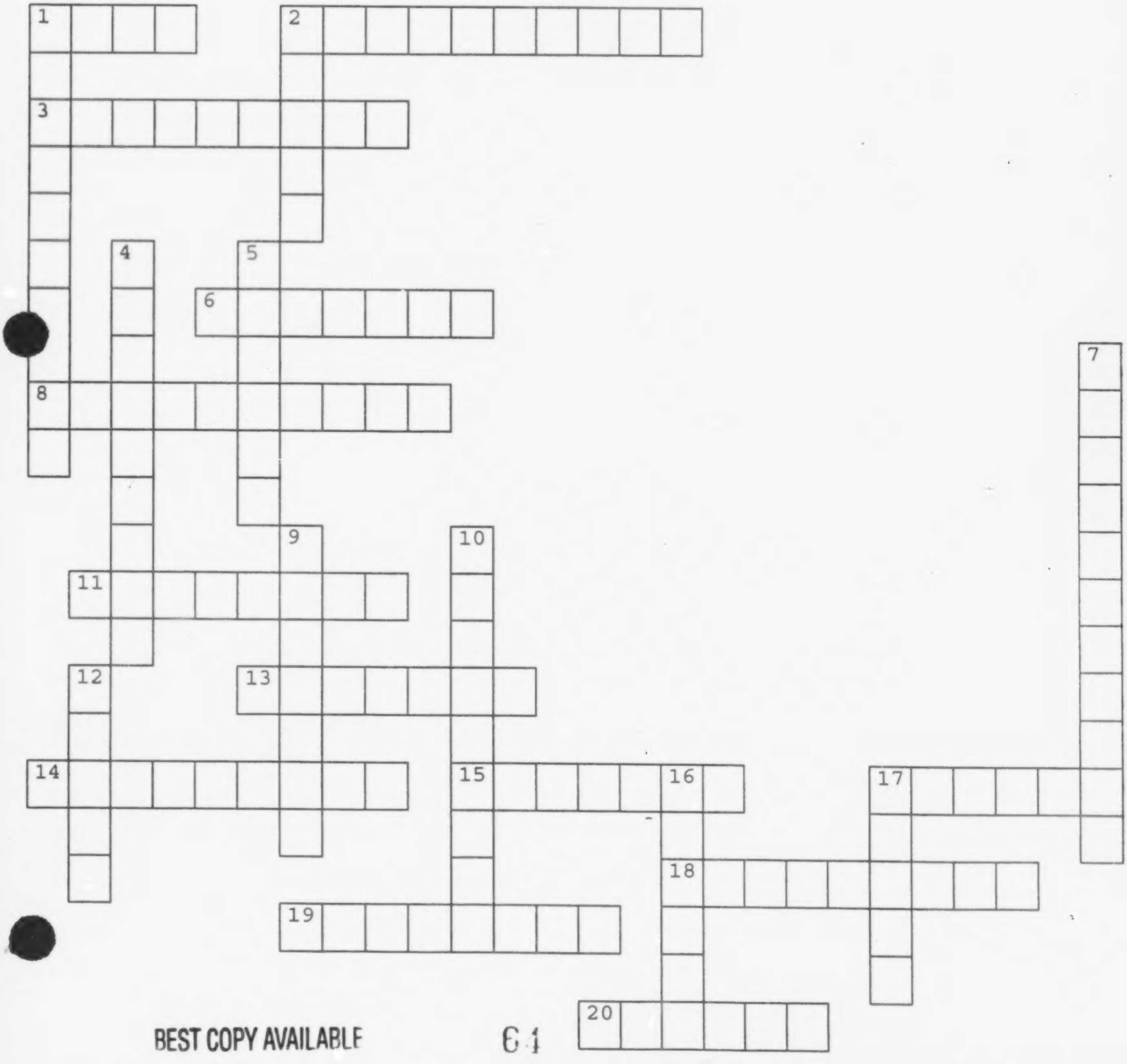
K. Stay alert when walking through plant areas. Watch for and correct tripping hazards - even small items such as paper clips, paper, pencils, nails, fittings, etc., can cause big accidents.

L. If you spill something, clean it up. Don't leave it for someone else to slip on. Contact supervisor for proper cleaning procedure of a spill.

Attachment H

Safety Level 1
Crossword Puzzle

Use the clues provided to work the crossword puzzle.



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ACROSS

1 Do not leave anything laying around for someone to ______ on.
2. Never use _______ air or other gases to blow dust off your skin or clothing.
3. Do not operate vehicles, machinery or _______ unless you are properly trained and specifically authorized to do so.
6. Stay alert when ________ through plant areas.
8. Report any unsafe condition to your _________.
11. Personal Protective Equipment is ___________ for certain jobs.
13. Shoes or boots made of durable ________ materials must be worn at all times when in the plant.
14. ________ has no place in the industrial environment and will not be tolerated.
15. Stay alert when walking _______ plant areas.
17. Never ______ the operator of a moving vehicle can see you.
18. Watch for and correct tripping hazards that can cause big _________.
19. Wear the equipment _______ and report any defective equipment to your supervisor.
20. A sloppy work area is ______ and leads to sloppy work habits.

DOWN

1. No _________ shirts or tank tops will be allowed.
2. If you spill something, _______ it up.
4. Never walk under a ________ load.
5. Sandals, open-toed shoes or shoes made of ______, nylon or plastic will not be allowed.
7. Steel-toed safety shoes offer the best protection and are highly ___________.
9. Keep your work area neat and ________.
10. Never use _________ tools or equipment, but report them to your supervisor.
12. Never _____ or obstruct fire fighting or emergency equipment exits.
16. Never operate tools, machinery or equipment without properly adjusted _______.
17. When walking through the parking lots or plant areas remain _____ for moving vehicles.

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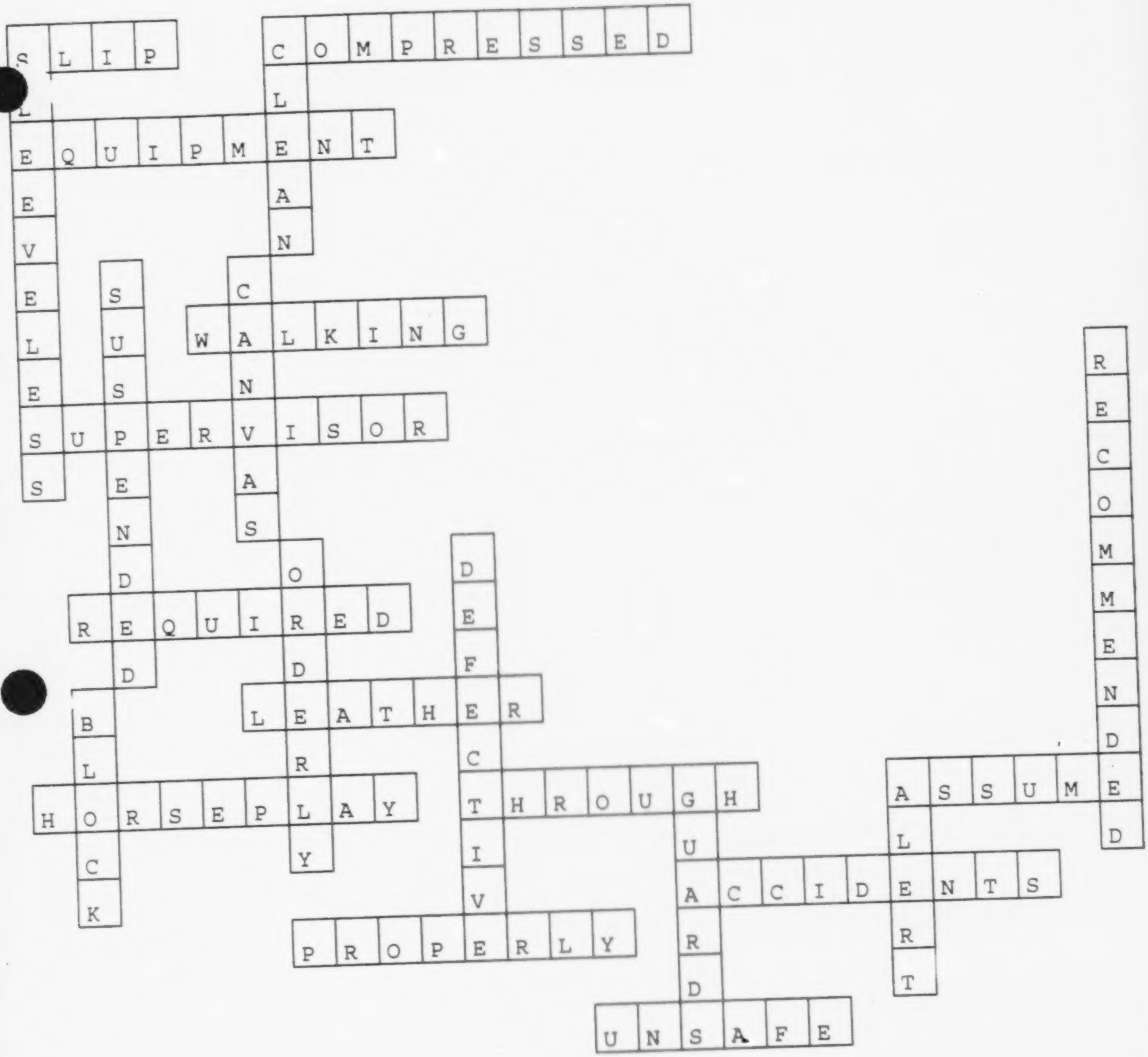

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Attachment I

TRUE OR FALSE?

DIRECTIONS: Read each statement below then circle the correct answer.

1. True False Contact lens can be worn on the production floor.
2. True False If you wear prescription glasses, you do not need to wear approved eye protection over the prescription glasses.
3. True False Protective helmet must be worn in work areas where the potential for injury from falling objects could occur.
4. True False Forklift drivers always have the right of way.
5. True False The only way to prevent hearing loss is to keep noise level down.
6. True False Socks are required to be worn only in cold weather.
7. True False Appropriate clothing must be worn at all times in the plant areas.
8. True False Steel-toed safety shoes offer the best protection.
9. True False Canvas tennis shoes are allowed in some areas of the plant.
10. True False In extremely hot weather, tank tops are allowed to be worn in the plant.
11. True False To be successful, the safety program requires the cooperation of every Lozier employee.
12. True False When walking in plant aisles, you should walk on the right side.

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Attachment I
Answer Sheet

TRUE OR FALSE?

DIRECTIONS: Read each statement below then circle the correct answer.

1. True **False** Contact lens can be worn on the production floor.

2. True **False** If you wear prescription glasses, you do not need to wear approved eye protection over the prescription glasses.

3. **True** False Protective helmet must be worn in work areas where the potential for injury from falling objects could occur.

4. True **False** Forklift drivers always have the right of way.

5. True **False** The only way to prevent hearing loss is to keep noise level down.

6. True **False** Socks are required to be worn only in cold weather.

7. **True** False Appropriate clothing must be worn at all times in the plant areas.

8. **True** False Steel-toed safety shoes offer the best protection.

9. True **False** Canvas tennis shoes are allowed in some areas of the plant.

10. True **False** In extremely hot weather, tank tops are allowed to be worn in the plant.

11. **True** False To be successful, the safety program requires the cooperation of every Lozier employee.

12. **True** False When walking in plant aisles, you should walk on the right side.

SAFETY TWO

Heat Stress
and
Back Injuries

Module: **Preventing Heat Stress and Back Injuries (Safety 2)**
Job Title: **General/New Hires**

Overall Time 60 min.
Page 1

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learner should be able to identify ways to prevent heat stress and back injuries and complete evaluation with 100% accuracy.	**Motivational Activity:** On overhead slide, show statistics on back injuries. Ask for class participation and list on a flip chart, accidents that have occurred and discuss how these injuries have effected his/her lifestyle. Relate home and work activities.	5 min	Overhead projector and transparency	Participation
	Vocabulary: Distribute cards with definitions. Words printed on cards will be posted on the wall. Learners with card with matching definition will place his/her card under the word.	10 min	Cards with words and definitions. Attachment A	Participation
	Guided Practice: Teacher will lead discussion on Heat Stress and Back injury. Show video on proper lifting techniques.	25 min	Attachments B, C, and D VCR, Video	Participation
	Independent Practice: Learners will complete worksheet (Attachment E).	10 min	Attachment E	Instructor will check worksheets for mastery.
	Closure: Discussion of worksheet answers.	5 min		Participation

LOZIER CORPORATION

Job Title: General/New Hires

Module: Prevention of Heat Stress and Back Injuries - (Safety 2)

Specific Instructional Objective: Learner should be able to identify ways to prevent heat stress, and back injury. Learner should be able to complete evaluation with 100% accuracy.

Motivational Activity: On overhead slide, show statistics on back injuries. Ask for class participation and list on a flip chart, accidents that have occurred and discuss how these injuries have effected his/her lifestyle. Relate home and work activities.

Vocabulary: Words and definitions will be printed on colored paper and laminated. Words will be displayed on the wall, definitions will be passed out to the learners. Learners will have to match their definition with the correct word on the wall. Glossary is provided in learners' materials (Attachment A).

Guided Practice: Instructor will lead discussion on Heat Stress and Back Injuries using overheads provided and Attachments B, C, and D. Show video of proper lifting techniques. (Video will be made of employees on the paint lines using proper lifting procedures.)

Independent Practice: Learners will complete worksheets (Attachment E).

Closure/Evaluation: Instructor will check worksheets for mastery.

Attachment A

VOCABULARY

Acclimatization - The process of adapting to a new environment.

Fatigue - Weariness from labor or exertion.

Dehydration - An abnormal depletion of body fluids.

Evaporation - Results of moisture being withdrawn leaving a dry surface

Heat Cramps - Painful (sometimes severe) cramps of the muscles used while working, such as the arms, legs or stomach. They often don't occur until later when relaxing after work.

Heat Exhaustion - A condition caused by over exposure to heat (a more severe condition than heat cramps).

Heat Stroke - The state of exhaustion and collapse caused by prolonged exposure to heat. Heat stroke develops when the body systems are overwhelmed by heat and begin to stop functioning.

Three Major Heat Disorders

Heat Cramps

Heat Exhaustion

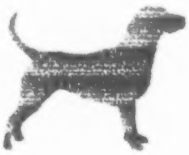
Heat Stroke

Of the three, heat stroke is the most severe. It is a medical emergency *requiring immediate attention. The state of exhaustion and collapse* caused by prolonged exposure to heat. Heat stroke develops when the body systems are overwhelmed by heat and begin to stop functioning.

Who is at Risk?

Everyone! Heat stress is not limited to people who are elderly, in poor health, or not as strong physically as others. Everyone is at risk, especially those who live in warm climates or who work in warm temperatures. Some examples of those who are often at risk are:

- Farmers
- Restaurant workers (in hot kitchens)
- Construction workers
- Military personnel
- Factory workers
- Athletes
- Animals



Heat disorders are preventable with proper planning, supervision and training.

Factors Affecting Heat Stress

Physical conditions that can hurt your body's natural ability to withstand high temperatures include:

- Dehydration (water loss)
- Diarrhea
- Exposure to high temperatures
- Fatigue
- Lack of acclimatization
- Loss of sleep
- Medications such as antihistamines, cold medicines, diuretics and some tranquilizers
- Recent immunizations
- Recent alcohol use - within 24 hours
- Wrong type clothing - tight clothing restricts circulation and keeps air from flowing over the skin

CONTROLLING HEAT STRESS

High temperatures put stress on our bodies. When the body's cooling system has to work too hard to reduce heat stress, it can strain itself. This physical strain - combined with other stresses such as work, loss of fluids, or fatigue - may lead to heat related illness. Your body always generates internal heat, but the amount of heat that stays stored in your body is effected by several factors. Some of these factors are:

- Surroundings
- Level of physical activity
- Type of work
- Time spent working
- Recovery time between work periods

You owe it to yourself and your fellow workers to recognize the signs of heat stress and know the proper first aid measures. You can take precautions to prevent heat stress in the following ways:

- Acclimatization
- Proper work procedures
- Appropriate food and ample water intake

Become Adapted to your Environment

If you can't control the temperature or humidity in your workplace, you must become acclimatized to it. Acclimatization is the ability to perform maximum amounts of strenuous work in the heat by gradually getting yourself accustomed to the climate you work in. Some workers reach full acclimatization within a week, while others take longer. If you go on vacation, remember that you will start losing your resistance to heat after one week, and you'll lose it completely in a month.

Follow proper Work Procedures

An important method for reducing the ill effects of heat stress is to follow scheduled work/rest cycles that keep an individual from overdoing. Sometimes it is possible for workers to alternate light and heavy work, indoor and outdoor work, etc.

Proper Food and Water Intake is Important

Most people don't realize that hot foods add directly to body heat. Heavy meals reduce your ability to get rid of heat because they redirect blood flow to your digestive track instead of your skin surface. Be sure your noon meal is light and cool. Plan on eating your heaviest meal of the day after the workday is over.

The most important step you can take to avoid heat disorders is to replenish water and salt used up by your body's cooling mechanisms. Fluid intake should equal fluid loss throughout the day. Drink 5 to 7 ounces of water every 15 to 20 minutes, even if you don't feel thirsty.

Except when treating heat disorders, ***salt supplements are not recommended***, since too much salt can cause higher body temperature, increased thirst and nausea. The normal diet usually has enough salt in it, but if you sweat continuously or repeatedly, you may use extra salt at the table. Salt tablets are considered harmful because the salt doesn't enter your system as fast as water or other fluids.

SAFETY GUIDELINES TO PREVENT BACK INJURIES

- Face the object squarely and get as close to it as you can.
- Balance yourself solidly, with your feet slightly apart.
- Squat down, bending your knees.
- Keep your back as straight and upright as possible.
- Grip the object firmly.
- Tighten your abdomen.
- Use your legs to bring you to a standing position, keeping your back straight.
- Perform the lifting technique smoothly and under control.
- Don't lift object over your head.
- Don't twist your body when lifting or setting an object down.
- Pace yourself to avoid fatigue.
- Don't reach over something to lift a load.

LET'S SEE WHAT YOU REMEMBER!

Directions: **Read each statement and write your answer in the space provided:**

1. List any four factors affecting heat stress. ______________________

____

____

2. List three ways you can help to control heat stress. ______________

____

____

3. List the five proper lifting techniques that will help prevent back injuries. ____

____

____

4. List something that you do at work that requires using proper lifting.____

____

5. List one thing you do at home that should involve proper lifting procedures. ____

____

Attachment D
Answer Sheet

LET'S SEE WHAT YOU REMEMBER!

Directions: **Read each statement and write your answer in the space *provided:***

1. **List any four factors affecting heat stress.** see attachment B, page 2

2. **List three ways you can help to control heat stress.** acclimatization; proper work procedures; appropriate food and ample water intake

3. **List the five proper lifting techniques that will help prevent back injuries.** see attachment C

4. **List one thing that you do at work that requires using proper lifting procedures.**

5. **List one thing you do at home that should involve proper lifting procedures.**

Attachment E

TRUE OR FALSE?

DIRECTIONS: Read each statement below then circle the correct answer.

1. True False The muscles of the abdomen help support the back.

2. True False Loss of sleep is not a factor affecting heat stress.

3. True False Keep your back as straight as possible when lifting.

4. True False For a safe lift, the load should be held as close to you as possible.

5. True False Heat disorders are not preventable.

6. True False Most of the power for lifting should come from your leg muscles.

7. True False To avoid back injury when lifting, make the lift smoothly and under control.

8. True False Salt tablets are not recommended except in treating certain conditions.

9. True False Heat stroke is the most severe heat disorder.

10. True False Hot meals do not add to body heat.

Attachment E

Answer Sheet

TRUE OR FALSE?

DIRECTIONS: Read each statement below then circle the correct answer.

1 **True** False The muscles of the abdomen help support the back.

2. True **False** Loss of sleep is not a factor affecting heat stress.

3. **True** False Keep your back as straight as possible when lifting.

4. **True** False For a safe lift, the load should be held as close to you as possible.

5. True **False** Heat disorders are not preventable.

6. **True** False Most of the power for lifting should come from your leg muscles.

7. **True** False To avoid back injury when lifting, make the lift smoothly and under control.

8. **True** False Salt tablets are not recommended except in treating certain conditions.

9. **True** False Heat stroke is the most severe heat disorder.

10. True **False** Hot meals do not add to body heat.

SAFETY THREE

Evacuation
and
Housekeeping

Module: **Evacuation & Housekeeping (Safety 3)**
Job Title: **General/New Hires**

Overall Time 60 min.
Page 1

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners will identify emergency response evacuation procedures and be able to list three possible hazards that could hinder their ability to respond to emergencies with 100% accuracy..	**Motivational Activity:**. Housekeeping video and discussion on ways housekeeping could effect evacuation procedures and accidents.	5 min	VCR and video	Participation
	Vocabulary: Use overhead transparency to define key words.	5 min	Overhead projector, transparency (Attachment A)	Participation
	Instructional Activities: Teacher will show video on portable fire extinguishers. Teacher will lead discussion on emergency evacuation procedures and proper housekeeping.	25 min	Video, TV, VCR, Lozier Safety procedures (Attachments B, C, and D)	
	Guided Practice: Assist learners in locating designated areas on blueprint.	5 min	Blueprints of designated areas.	Participation
	Independent Practice: Learners will complete assignments independently.	15 min	Attachments E, F, and G	Instructor will check worksheets for mastery.
	Closure: Discussion of worksheet answers.	5 min		Participation

LOZIER CORPORATION

Job Title: New Hires/General Packaging

Module: Evacuation/Housekeeping - Safety 3

General Instructional Objective: To familiarize learners with safety evacuation and housekeeping procedures.

Specific Instructional Objective: Learners will identify emergency response procedures and be able to list, with 100% accuracy, three possible hazards that could hinder their ability to respond to emergencies.

Motivational Activity: Show housekeeping video and lead discussion on ways housekeeping could effect evacuation procedures and effect accidents.

Vocabulary: Use overhead transparency to discuss key words (Attachment A). A glossary is provided in learners' material and may be used as a reference.

Instructional Activities: Teacher will inform learners of location of portable fire extinguishers. (Three locations are marked in red.) A video on use of portable fire extinguishers will be shown.

Teacher will lead discussion on emergency evacuation procedures for both fire/non-weather related emergencies and tornado/weather related emergencies (Lozier safety procedures will be provided). Teacher will also lead discussion on proper housekeeping procedures.

Guided Practice: Using the blueprints for fire and severe weather designated areas, teacher will assist learners in finding the designated area to which he/she should report in case of an emergency.

Independent Practice: Learners will read scenarios and write answers in the space provided (Attachment E). Learners will complete safety worksheet and crossword puzzle (Attachments F and G).

Closure/Evaluation: Teacher will review answers on worksheet and puzzle.

Attachment A
Transparency

Key Words

All clear

Continuous blast

Emergency coordinator

Hazards

Hazard hunt

Intermittent blast

Severe Weather Warning

Tornado Warning

Tornado Watch

Utilities personnel

Attachment A

KEY WORDS

All clear -- Signal given by weather radio or the Emergency Coordinator that the building or area has been cleared.

Continuous blast -- An alarm advising all employees to evacuate the building.

Emergency coordinator -- Person responsible for implementing proper evacuation procedures for Lozier employees.

Hazard -- Risk or danger.

Hazard hunt -- Periodic inspections to identify possible hazards.

Intermittent blast -- An alarm advising all employees that a Tornado Warning has been issued and to report to their designated area.

Severe Weather Warning -- Local weather activity.

Tornado Warning -- Confirmed sighting of a tornado in the local area.

Tornado Watch -- Weather conditions are favorable for a tornado.

Utilities personnel -- Person who will shut down all necessary main power and/or gas supplies prior to going to their designated shelter.

NOTE: This page was omitted because it contained Lozier specific information concerning company tornado alert plan.

NOTE: This page was omitted because it contained Lozier specific information concerning company fire evacuation plan.

NOTE: This page was omitted because it contained Lozier specific information concerning company non-weather related emergency evacuation plan.

Housekeeping

WHY IS IT IMPORTANT?

Good housekeeping is an important safety issue. Many of the potentially dangerous materials, tools, and substances we work with are lying in wait for trouble in the work area. Even items that aren't really hazardous can become so when they're left lying around where people can trip over them or bump into them.

Good housekeeping has other virtues. When your work area is clean and neat, it's a lot easier to find what you need and do your job efficiently. It also makes it much easier to respond or get out fast in an emergency.

Good housekeeping is everyone's responsibility. Good housekeeping has to be constant and ongoing if it's going to prevent and eliminate hazards in your work area.

Think about it........
Most of us spend more waking hours at work than we do at home. A neat and orderly work place is a safer and more pleasant work place!

General Hazards

Almost any hazard that can exist at work can exist in your work area. A fair percentage of them can be prevented by keeping things where they should be and keeping the area clean. Among the hazards that good housekeeping can help prevent are:

- Fire
- Getting hit by objects
- Punctures, splinters, and cuts
- Tripping and falling
- Chemical exposure and spills
- Chemical reactions

Housekeeping's role in safety is to prevent and remove hazards by keeping the work area in good condition continually, not just on an occasion when you have nothing better to do.

Identifying Hazards

There are several types of hazards of which you should be continually alert so that they can be eliminated immediately. If you train your eyes to look for these hazards, you can eliminate them before they cause trouble.

Tripping and falling hazards occur when anything is placed on the floor that doesn't belong there: machines, tools, cords, cables, air hoses, scrap, boxes, etc. Floors should be kept clear. You can protect yourself and others from tripping and falling hazards by not keeping anything that doesn't belong, even temporarily, on the floor. Every machine and tool, every material and substance we use belongs in some specific place.

Keeping the floor clear is, of course, especially important in aisles and passageways.

Did you know......
More than 200,000 people in the United States are injured on the job from slips, trips, and falls every year.

Contact hazards are created by objects that can hit you or that you can bump into. Open drawers and tools left perched precariously on a table are typical examples. Contact hazards can be prevented by putting things away properly. Don't leave tools or materials on the edge of a surface where they can fall. Don't leave drawers open where someone can bump into them. Put things where they belong!

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Puncture and splinter hazards exist when sharp-edged or pointed tools are left out of place. Splinters can develop on any surface or on a variety of materials. There is no excuse for leaving sharp or pointed objects lying around where someone - *like you* - could find them in a hand or even an eye!

Splinters are a little less obvious. To avoid splinters, if you find a rough edge, either cover it or sand it off.

Electrical hazards that you are likely to find include: overloaded circuits, extension cords, and cords left near heat or water. Anything that could cause fire or shock is an electrical hazard.

Protect *yourself* and *others* from electrical hazards by knowing the basics of electrical safety. Don't overload circuits and be sure you're using the correct plug in the correct outlet. Make sure wiring insulation is intact. Extension cords are to be used only for temporary purposes. **Never** leave a cord near heat or water.

Chemical exposure or spills are always a risk when chemical containers are in the work area, especially if they're left open. Chemical reactions can occur if the chemicals in the work area are allowed to mix with things that will cause dangerous reactions such as other chemicals, water, or air.

To prevent chemical spills, inspect containers regularly to make sure there are no leaks. If there is a small spill, clean it up immediately according to the procedures on the MSDS and our company policy.

Fire Hazards are reduced when you practice electrical safety and keep an eye out for anything in the work area that could burn.

If you're working with flammable liquids, make sure they're kept in approved flammable liquid containers and that they are never kept near an ignition source.

Watch out for flammable scrap, such as oil soaked rags. These should be disposed of in approved flammable solid containers that are emptied daily.

You accomplish another part of fire safety when you eliminate tripping and falling hazards. If there is a fire, the aisles and passageways must be clear so you can get out and firefighters can get in. You should also keep this in mind when you stack materials; don't pile them so high they interfere with the sprinklers.

Disposing of general trash properly and promptly will reduce fuel sources in the event of a fire. Overflowing trash cans and hoppers just add fuel to the fire and are considered a fire hazard.

Here are some extra housekeeping tips to keep in mind:

- Dispose of food and drinks out of the work area. These can be contaminated by chemicals, attract bugs, and add to the general clutter.
- Don't keep scraps of miscellaneous items just because you feel these might come in handy someday. If you really think you can use them, choose a shelf or drawer, label it, and keep the items there.

It's not hard to keep your work area clean, uncluttered, and safe -- and it makes for much more pleasant and productive working conditions!

Remember -- Everything has its place and should be put there.

Cleanliness + Organization = Good Housekeeping

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Good Housekeeping Safety Checklist

- Keep all tools and materials in their proper place when not it use.
- Keep sharp edges covered or enclosed.
- Keep the floor clear at all times.
- Keep cords, cables, and air hoses from becoming a tripping hazard.
- Avoid stacking materials in aisles, passageways, or to close to sprinklers.
- Close all drawers.
- Cover or sand off splinters.
- Use permanent wiring, not extension cords, whenever possible.
- Keep wires and cords untangled.
- Keep cords away from heat and water.
- Keep flammable liquids in approved flammable liquid containers and away from ignition sources.
- Clean up spills immediately.
- Dispose of oily rags in approved flammable solid containers that are emptied daily.
- Remove only necessary quantities of chemicals from containers.
- Make sure all chemical containers are labeled.
- Keep chemical containers closed when not in use.
- Check chemical containers regularly for leaks.
- Don't let grease or dirt build up on floors or surfaces.
- Report holes, loose boards, and other flooring problems.
- Throw away trash promptly and properly.

Directions: ***Read the following scenarios and determine if the correct decision was made.***

Scenario 1

Jeremy was told by a co-worker that the "thunder storm warning" in effect for Scottsboro had been upgraded to a "tornado watch". Jeremy informed the other workers in his area, and they immediately went to the designated tornado shelter area.

Did they follow the correct procedure? _______________

Why or why not?

Scenario 2

James clocked in at 2:30 p.m. in the storage shelf department. At 4:00 p.m. he was asked to help in another area. At 5:15 p.m. the fire alarm (continuous blast) sounded. James left the building at the nearest exit in the area he was working and remained at the designated location for the workers in that area.

Did he follow the correct procedure? ____________

Why or why not?

Directions: ***Read the following scenarios and determine if the correct decision was made.***

Scenario 1

Jeremy was told by a co-worker that the "thunder storm warning" in effect for Scottsboro had been upgraded to a "tornado watch". Jeremy informed the other workers in his area, and they immediately went to the designated tornado shelter area.

Did they follow the correct procedure? ___No___

Why or why not? **A "tornado watch" means that conditions are favorable for a tornado to occur. You should be alert for changing weather conditions and go to designated area when the tornado warning is heard (intermittent blast).**

Scenario 2

James clocked in at 2:30 p.m. in the storage shelf department. At 4:00 p.m. he was asked to help in another area. At 5:15 p.m. the fire alarm (continuous blast) sounded. James left the building at the nearest exit in the area he was working and remained at the designated location for the workers in that area.

Did he follow the correct procedure?___Yes___

Why or why not? **The supervisor in the storage shelf department would have been made aware of the employee's move to another area at 4:00 p.m. He/she will be included in the head count in the area he/she was working at the time of the alarm.**

Attachment F

SAFETY WORKSHEET

Directions: Read the definitions below and place the correct word in the blank provided.

All Clear
Emergency Coordinator
Fire Exits
Intermittent Blast
Severe Weather Warning
Tornado Watch
Continuous Blast

Designated Area
Evacuation Point
Fire Extinguisher
Legend
Tornado Shelter
Utilities Personnel
Hazard Hunt

Emergency
Fire Aisle
Housekeeping
Procedure
Tornado Warning
Hazard

1.____________________ Person who will shut down all necessary main power and or gas supplies prior to going to their designated shelter.

2.____________________ Local weather activity.

3.____________________ Signal given by weather radio or the Emergency Coordinator that the building or area has been cleared.

4.____________________ Confirmed sighting of a tornado in the local area.

5.____________________ Person responsible for implementing proper evacuation procedures for Lozier employees.

6.____________________ Weather conditions are favorable for a tornado.

7.____________________ An alarm advising all employees to evacuate the building.

8.____________________ Periodic inspections to identify possible hazards.

9.____________________ Designated location within the plant that employees report to in case of severe weather.

10.____________________ An alarm advising all employees that a Tornado Warning has been issued and to report to their designated area.

Attachment I
Answer Sheet

SAFETY WORKSHEET

Directions: Read the definitions below and place the correct word in the blank provided.

All Clear
Emergency Coordinator
Fire Exits
Intermittent Blast
Severe Weather Warning
Tornado Watch
Continuous Blast

Designated Area
Evacuation Point
Fire Extinguisher
Legend
Tornado Shelter
Utilities Personnel
Hazard Hunt

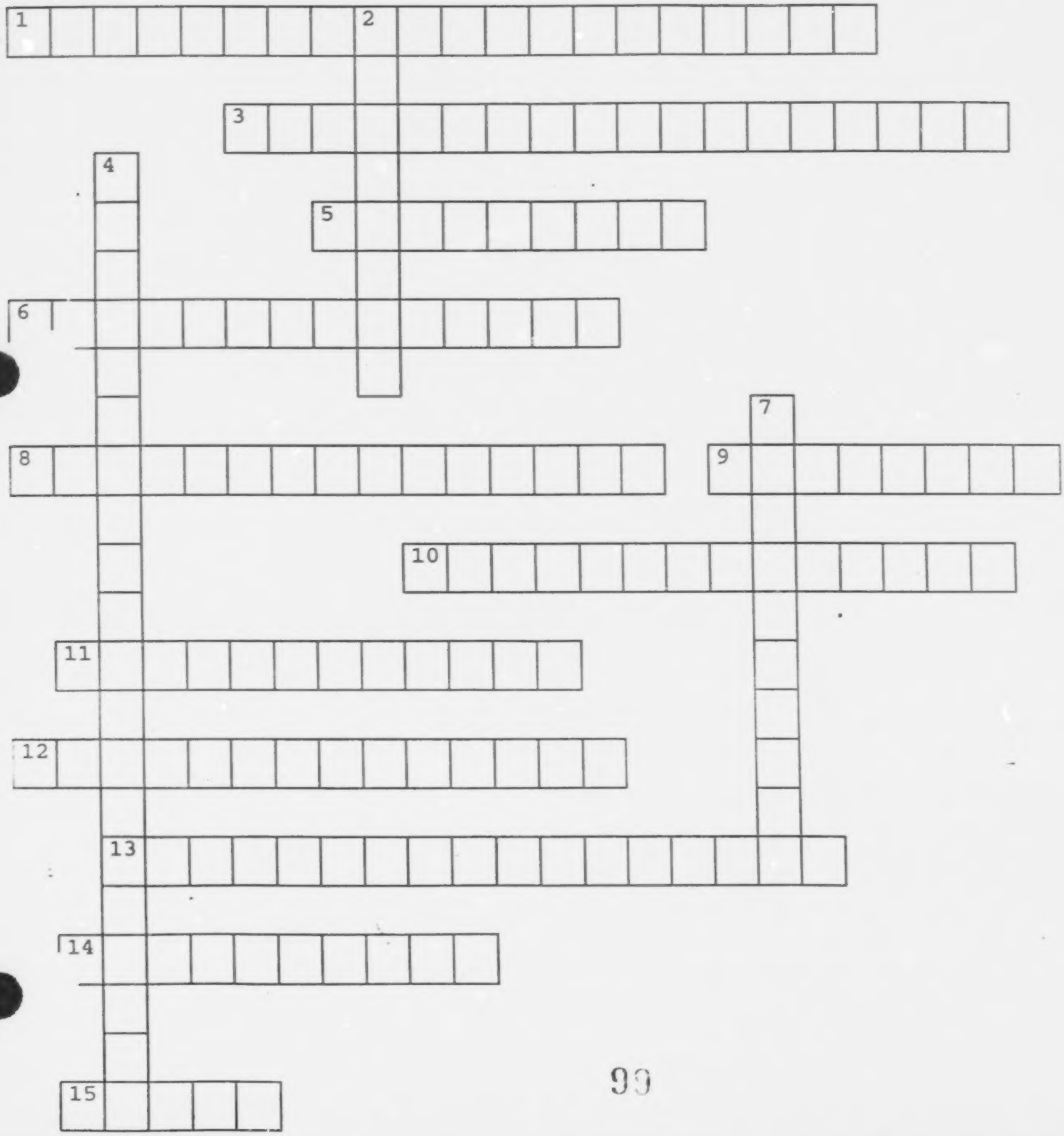
Emergency
Fire Aisle
Housekeeping
Procedure
Tornado Warning
Hazard

1. Utilities Personnel	Person who will shut down all necessary main power and or gas supplies prior to going to their designated shelter.
2. Severe Weather Warning	Local weather activity.
3. All Clear	Signal given by weather radio or the Emergency Coordinator that the building or area has been cleared.
4. Tornado Warning	Confirmed sighting of a tornado in the local area.
5. Emergency Coordinator	Person responsible for implementing proper evacuation procedures for Lozier employees.
6. Tornado Watch	Weather conditions are favorable for a tornado.
7. Continuous Blast	An alarm advising all employees to evacuate the building.
8. Hazard Hunt	Periodic inspections to identify possible hazards.
9. Tornado Shelter	Designated location within the plant that employees report to in case of severe weather.
10. Intermittent Blast	An alarm advising all employees that a Tornado Warning has been issued and to report to their designated area.

Attachment G

Safety Level 3
Crossword Puzzle

Using the clues provided, work the crossword puzzle.

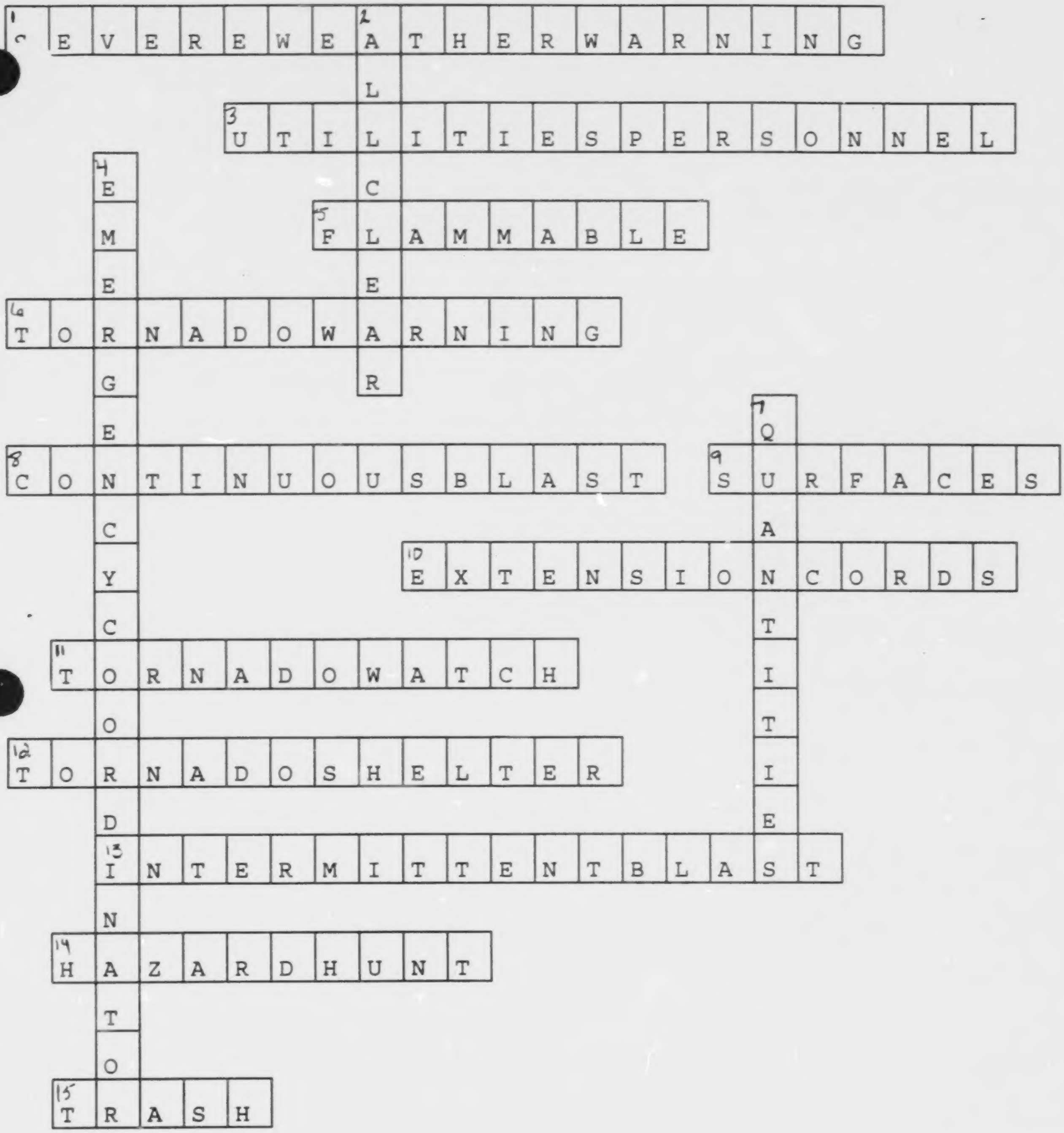


ACROSS

Local weather activity. (3 words)
. Person who will shut down all necessary main power and or gas supplies prior to going to their designated shelter. (2 words)
5. Dispose of oily rags in approved __________ solid containers that are emptied daily.
6. Confirmed sighting of a tornado in the local area. (2 words)
8. An alarm advising all employees to evacuate the building. (2 words)
9. Dont's let grease or dirt build up on floors or ________.
10. Use permanent wiring, not ___________ ______ whenever possible. (2 words)
11. Weather conditions are favorable for a tornado. (2 words)
12. Designated location within the plant that employees report to in case of severe weather. (2 words)
13. An alarm advising all employees that a Tornado Warning has been issued and to report to their designated area. (2 words)
. Periodic inspections to identify possible hazards. (2 words)
15. Throw away ______ promptly and properly.

DOWN

2. Signal given by weather radio or the Emergency Coordinator that the building or area has been cleared. (2 words)
4. Person responsible for implementing proper evacuation procedures for Lozier employees. (2 words)
7. Remove only necessary __________ of chemicals from containers.



1 SEVEREWEATHERWARNING

2 ALLCLEAR

3 UTILITIESPERSONNEL

4 EMERGENCYCOORDINATOR

5 FLAMMABLE

6 TORNADOWARNING

7 QUANTITIES

8 CONTINUOUSBLAST

9 SURFACES

10 EXTENSIONCORDS

11 TORNADOWATCH

12 TORNADOSHELTER

13 INTERMITTENTBLAST

14 HAZARDHUNT

15 TRASH

BLOODBORNE PATHOGENS

Module: **Bloodborne Pathogens** **Overall Time 35 min.**

Job Title: New Hires/General **Page 1 of 1**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners should be able to define the term Bloodborne pathogens (BBP) and complete evaluation with 100% accuracy.	**Motivational Activity:** Before learners enter the classroom, spill a red substance on floor or table. Ask for a volunteer to clean up spill. Have necessary materials needed to properly clean up the spill.	5 min	Red substance, gloves, chlorine powder, rag, disposable scoop, red trash bag.	
	Vocabulary: Instructor will present key words on overhead and discuss meanings.	5 min	Attachment A	Observation
	Instructional Activity: Instructor will present PowerPoint Presentation.	10 min	Lap top computer and Attachment B	
	Guided Practice: Instructor will work with learners to identify steps to be taken in case of exposure.	5 min		
	Independent Practice: Learners will complete true and false exercise	5 min	Attachment C	Participation
	Closure/Evaluation: Discuss answers to true and false questions.	5 min		Check for accuracy

LOZIER CORPORATION

Job Title: General/New Hires

Module: Bloodborne Pathogens

Specific Instructional Objective: Learners should be able to define the term Bloodborne pathogens (BBP) and complete evaluation with 100% accuracy.

Motivational Activity: Before learners enter the classroom, spill a red substance on floor or table. Ask for a volunteer to clean up spill. Have necessary materials needed to properly clean up the spill.

Vocabulary: Instructor will present key words on overhead and discuss meaning. Learners will be provided words and definitions on Attachment A in workbooks.

Instructional Activity: Instructor will provide learners with information on bloodborne pathogens using PowerPoint presentation. Information will be provided to learners on Attachment B in workbooks.

Guided Practice: Instructor will work with learners to identify steps to be taken in case of exposure.

Independent Practice: Learners will complete true and false exercise (Attachment C).

Closure/Evaluation: Discuss answers to true and false questions.

Key Words

Bloodborne pathogens (BBP)

Universal Precautions

Minimal

Biohazard

Confidential

Key Words

Biohazard -- Material that poses a threat to humans or their environment

Bloodborne pathogens (BBP) -- Viruses or bacteria that live in blood or body fluids and cause disease. Example of body fluids: blood, secretions, unfixed tissues or organs other than skin, vomit and waste (may contain blood)

Confidential -- Entrusted with confidence

Minimal -- Smallest degree or amount

Universal Precautions -- Treat all blood and body fluids as potentially infectious

Bloodborne Pathogens
may be
DEADLY!!

The keys to preventing infection are:

- Understanding the dangers you face
- Knowing how to protect yourself

Two significant Bloodborne diseases are:

- Hepatitis B virus (HBV)
- Human Immunodificiency Virus (HIV)

Characteristics of Hepatitis B Virus (HBV)

- Liver disease that can severely damage the liver and lead to cirrhosis and other liver disorders
- Virus may be carried for many years with the individual looking and feeling healthy, unaware he/she is infected
- Most people recover with little effects
- Bigger threat than AIDS because HBV is more common

Characteristics of Human Immunodeficiency Virus (HIV)

- Body is unable to fight infections and other diseases
- Causes AIDS
- Virus may be carried for many years with the individual looking and feeling healthy
- No cure - 100% fatal

Workplace Exposure

Risk

As in any workplace, **risk is present** at Lozier, however, the **risk is minimal** if basic rules are followed.

Sources

- Cutting yourself on an infected object
- Getting infected fluid in open pores, nicks, or cuts on skin
- Getting infected fluid in mucous membranes of eyes, nose, or mouth

What to do

- **If you see exposure**
  1. Call your Supervisor **immediately**
  2. Use "Universal Precautions"
  3. **AVOID** the area
  4. Make as little contact with the injured as possible

- **If you are exposed**
  1. Don't panic
  2. Call your Supervisor **immediately**
  3. Wash your skin with soap and water
  4. Flush you eyes/nose/mouth with water
  5. Determine the source of exposure
  6. Get testing and counseling if necessary

- **If you cause an exposure**
  1. Call your Supervisor **immediately**
  2. Remember the rule of "Universal Precautions"
  3. Limit contact with others
  4. Contain the fluid as safely as possible with gloves, rags, papers, or other material available

Assess the Situation

Your first step in a medical emergency before attempting a rescue must be to look around and ask yourself, "Is the scene safe for me?". Too often well-intentioned rescuers become victims themselves when they risk their safety to help others. Don't think that rushing in will make you a hero. If the area is unsafe, go for help or put on the personal protective equipment that will permit you to assist safely.

Exposure Control

1. **Wash Hands** with antibacterial soap (after removing disposable gloves).
2. **Contaminated Waste** is treated as infectious - use special container/red bag.
3. **Contaminated Clothing** should also be placed in red bag.
4. **Sharp Items** such as needles/glass should be placed in plastic non/retrievable containers
5. **Work Area Restrictions** No eating, drinking, cosmetics or contact lenses in areas of possible exposure.

Remember: Testing and counseling are CONFIDENTIAL!!

Clean-Up

1. Gloves - to be worn at all times.
2. Pooled blood or body fluids are to be cleaned up with absorbent chlorine powder & disposable scoop, and then put into red biohazard bag.
3. Housekeeping employees are to clean hard surfaces/counters.
4. Never pick up broken glass by hand - use a brush or tongs.
5. All rest room trash is to be handled as if it is infected.
6. Equipment that has been contaminated should be decontaminated and inspected prior to use.
7. The First Responder is responsible for cleaning up all related spills.

REMEMBER

All blood and other body fluids will be considered potentially infectious and handled as directed by company policy.

Summary

- Bloodborne pathogens can be **FATAL**
- Risk is minimal if basic rules are followed.
- Use "Universal Precautions"

Attachment C

Bloodborne Pathogens

Directions: Answer true or false to the following questions.

TRUE FALSE 1. Understanding of Bloodborne pathogens is important because exposure may lead to serious illness or death.

TRUE FALSE 2. Bloodborne pathogens are transmitted only through blood.

TRUE FALSE 3. Hepatitis B Virus is more common than HIV or AIDS virus.

TRUE FALSE 4. Universal precautions mean that you should treat all blood and body fluids as if they are infected with HIV, HBV or other blood borne pathogens.

TRUE FALSE 5. Work gloves are adequate Personal Protection Equipment for exposure to blood borne pathogens.

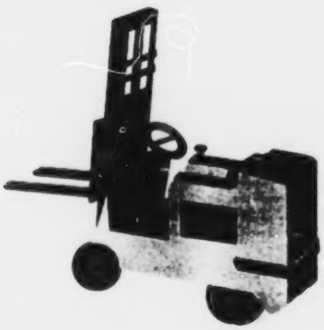
TRUE FALSE 6. If you are exposed to Bloodborne pathogens you may be referred for testing, treatment and/or counseling.

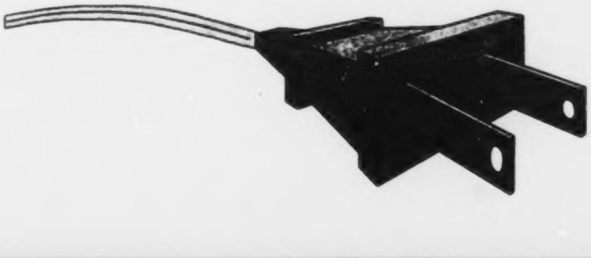
TRUE FALSE 7. If you are cut, you should try to limit the amount of the exposure of blood and contact your supervisor.

TRUE FALSE 8. The First Responder is responsible for cleaning up all bloodborne related spills.

LOZIER

SAFETY AWARENESS





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Module: **Safety Awareness Program** **Overall Time: 1 hr. 30 min.**
Job Title: **New Hires/General**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners should be able to recognize hazards, conduct hazard hunt, and complete evaluation with 100% accuracy.	**Motivational Activity:**. Instructor will select a motivational that is appropriate for the class from provided list of activities.	10 min		
	Vocabulary: Introduce unfamiliar words or terms.	5 min	(Attachment A)	Participation
	Instructional Activity: Instructor will present safety awareness PowerPoint presentation. (Information provided in notebooks.)	25 min	Laptop computer, projection panel, screen, Powerpoint presentation, TV, VCR, video	
	Show accident video.	15		
	Guided Practice: Instructor will assist learners in beginning a hazard hunt.	5 min	Safety hazards place around the classroom	Participation
	Independent Practice: Learners will complete the hazard hunt.	15 min		Participation
	Closure: Instructor will bring class back together for discussion of hazard hunt.	10 min		
	Evaluation: Learners will complete True/False worksheet.	5 min		Check for accuracy

Lozier Corporation

Job Title: New Hire Orientation

Module: Safety Awareness Program

General Instructional Objective: To increase total plant safety awareness.

Specific Instructional Objective: Learners will be able to recognize hazards, conduct a hazard hunt, and complete evaluation with 100% accuracy.

Key Words: Instructor will introduce key words and ask volunteers to provide definitions.

Instructional Activity: Instructor will present safety awareness information using PowerPoint presentation. Learners will be provided pertinent information in their notebooks. Instructor will show accident video.

Guided Practice: Instructor will assist learners in conducting a hazard hunt.

Independent Practice: Learners will complete hazard hunt activity independently or in groups.

Closure: Instructor will bring the group back together for a brief interactive discussion of the hazard hunt.

Evaluation: Learners will complete True/False evaluation.

KEY WORDS

Safety audit **- Assessment of areas of the plant to identify potential hazards in the work environment.**

Hazard hunt **- Daily inspection performed by employees or supervisors to detect hazards in the work environment before an unsafe act or condition can cause injury.**

OSHA (Occupational Safety and Health Administration) **- Government agency that provides and enforces laws that govern the workplace and insures the safety of the employees.**

Employee Safety Awareness and Involvement Program

The goal for the program is to increase total plant safety by identifying and eliminating hazards in the work area and by increasing total employee involvement and awareness. The program is categorized by DEPARTMENT, PLANTWIDE, and INDIVIDUAL.

Safety Committees

Hazard Hunt

What is a Hazard Hunt?

⇒ Daily inspection performed by employees or supervisors to detect hazards in their work environment before an unsafe act or unsafe condition can injure someone.

When should they be performed?

⇒ In the first 10-20 minutes of the shift.

Q: Why wouldn't they be done at the end of the shift?
A: So that any immediate safety hazards in the work area can be detected and corrected prior to the start of work.

⇒ We would like to see the departments working as a team with a goal of having no injuries.
⇒ If hazards are inspected for at the start of the shift, the employee can notify the supervisor or lead to correct the hazard immediately before someone is injured.

Who should perform the Hazard Hunt?

⇒ Everyone in the department should take a turn.
⇒ Your department lead person or supervisor will have a rotating schedule of who is to perform the hazard hunt for the day, week, month, etc.
⇒ All employees in the department will perform them because Lozier feels that everyone needs to know how to identify hazards and how to correct them.
⇒ Doing daily hazard hunts is a way to practice this skill.

What should I do with the Hazard Hunt form when I am finished?

⇒ Give it to your supervisor, lead person, or place it directly in a predetermined department location.

What should I do if I have spotted a hazard that is not on the list or one that I could not correct myself?

⇒ Make sure that you immediately inform your supervisor or lead person so that they can begin to have the hazard corrected.
⇒ If you do not inform your supervisor or lead person, there is a possibility that the hazard will go undetected and could injure someone.
⇒ Do not assume that your supervisor or lead person will automatically see that same hazard that you do.
⇒ If you place a completed hazard hunt in a predetermined location, do not assume that the supervisor or lead person is going to read through the form immediately.
⇒ Hazards need to be corrected as soon as possible.

What types of hazards will I be looking for?

⇒ Tools in proper working condition, i.e. stripped, excessively worn, deformed, mushroomed, broken and repaired properly.
⇒ Product stored safely in racks or neatly on pallets.
⇒ Fire equipment is not blocked, including fire doors and routes.
⇒ Housekeeping in the department is in good order.
⇒ Personal Protective Equipment is used at the appropriate times.
⇒ Secondary Containers are properly labeled.
⇒ No food or drink in paint areas.
⇒ Leaning items against walls, railings, machines, etc.
⇒ Aisles clear of pallets, material, trip hazards.

Safety Audits

What is a Safety Audit?

⇒ An assessment of the areas of the plant to identify potential hazards in our work environment.
⇒ These audits should be used as a driving mechanism to increase awareness to potential hazards in the workplace that could cause unsafe conditions.

When are Audits Conducted?

⇒ Monthly in the plants.
⇒ There are also other safety audits conducted on a daily and/or weekly basis.
⇒ We conduct these audits in accordance with OSHA standards and LOZIER policies to ensure unsafe conditions that our workers could be exposed to in the plant are corrected in a timely manner.

What types of hazards will they be looking for during the audit?

⇒ The same types of hazards that are addressed in the daily hazard hunts with an intense look at the whole plant.
⇒ During the audit, we also observe for three unsafe acts that are happening at that time.
⇒ This is a training mechanism for their supervisor to see how they will react to the violation.
⇒ We also look for one specific item each month.

Severity of the hazards

A = A severe hazard that is immediately dangerous to life, limb, or health, and directly violates an OSHA standard and company policy. Must be corrected immediately within the work day. If it cannot be corrected immediately, steps must be taken to isolate the hazard until corrective actions can be implemented.

B = A less severe hazard that could be immediately dangerous to life, limb, or health. Must be corrected or isolated within 2 working days.

C = Need everyday attention and must be handled as such. Must be corrected within 4 working days before they become serious.

These guidelines give the supervisors timelines in which these hazards should be corrected to help ensure we keep a safe working environment for the employees of Lozier.

Who should perform the safety audits?

⇒ Safety coordinator and a Supervisor.

⇒ Supervisors rotate each month in order for each to understand what hazards to be looking for in their departments.

⇒ Upon completion of the safety audit, a report is generated explaining the hazards that were found in the workplace.

What is the difference between a hazard hunt and a safety audit?

⇒ Hazard hunt is a daily check of hazards in your area.

⇒ Safety audit is an assessment of the whole plant in a more intense look for potential safety hazards.

What is done with the correction the Safety Audit?

⇒ Once all of the safety hazards have been corrected and /or a work order written for the problem, a follow-up report will be written with responses to each hazard.

Safety Meetings

What is a safety meeting?

⇒ A meeting to discuss safety issues that employees may encounter in the workplace.

⇒ Informational meetings used to inform employees about safety practices at Lozier and how to prevent getting hurt.

When are meetings held?

Who performs the safety meeting?

What subjects are discussed?

⇒ Lockout Tagout
⇒ PPE
⇒ Machine Guarding
⇒ Forklift Safety
⇒ Hazardous Communication
⇒ Accident Review
⇒ Hearing Conservation
⇒ Bloodborne Pathogen
⇒ Emergency Evacuation/Fire Drills
⇒ Crane Safety

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EMPLOYEE SAFETY AWARENESS AND INVOLVEMENT PROGRAM

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Attachment C

STORAGE SHELF
SAFETY INSPECTION

SAFE	UNSAFE	CORRECTED (w.o. number if applicable)	
______	______	______	1. All power boxes have padlocks and three feet clearance..
______	______	______	2. No unsafe stacks on tables , conveyors, or in racks.
______	______	______	3. Are all materials staged neatly and in their proper place?
______	______	______	4. Are there any trip hazards? banding, brooms, cords, pallets, etc.
______	______	______	5. Fire exits and aisles not blocked.
______	______	______	6. Fire extinguishers, charged and not blocked.
______	______	______	7. All electrical receptacles are covered and in good condition.
______	______	______	8. All electrical cords are in good condition. (prongs, frayed, not causing trip hazard, etc.)
______	______	______	10. Housekeeping is in good order. (no banding in aisles, trash hoppers not overflowing, no leaning pallets, no spills, no clutter, scrap hoppers not overflowing, etc.
______	______	______	11. Are fork lift operators conducting daily fork lift inspections?
______	______	______	12. Disconnects locked out when performing any maintenance.
______	______	______	13. Are safety chains in place at the crane.
______	______	______	14. All guards in good condition and in place. (P-4, PE-1, B-2, C-6, CS-1)
______	______	______	16. All safety switches in place and operable. (CBB-1, banders, B-2)
______	______	______	17. Safety glasses, side shields, gloves & arm guards, and ear plugs are being worn. (CIRCLE ITEMS NOT BEING WORN)
______	______	______	18. Check safety switches on nail guns.
______	______	______	19. Do all electrical boxes have knockouts in place?
______	______	______	20. Any spills on the floor?
______	______	______	21. Is floor swept? Is sawdust swept off the floor?

NOTES:____

____

____

____

____

Date______________ Shift__________ Inspector______________________

Attachment D

ABC Violation Chart

A = **Immediately dangerous.** Must be corrected immediately (within the work day)

B = **Could be immediately dangerous.** Must be corrected as soon as possible (within 2 working days)

C = **Not immediately dangerous.** Must be corrected as soon as possible (within 4 working days)

Attachment E

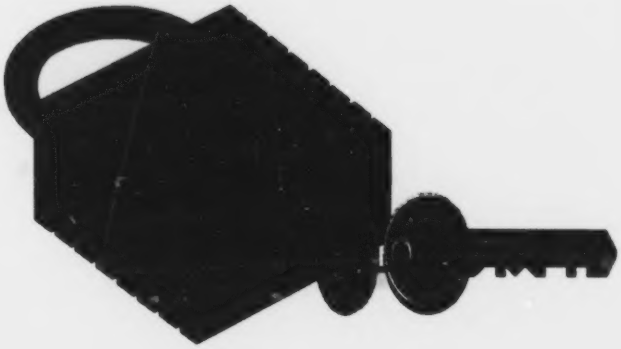
Employee's Responsibility in Accident Reporting

- **Report all accidents to your supervisor, no matter how small they seem**
- **Receive a drug and alcohol screen prior to leaving the doctor's office**
- ***Employee must bring Form 58115 to his/her supervisor/area* manager when returning to work**

Red Light - Green Light

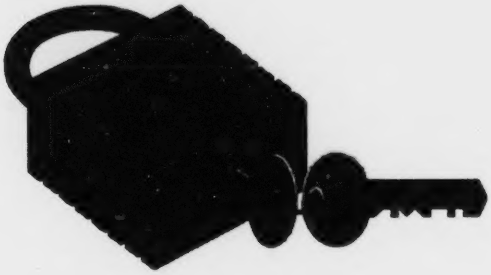
- **Red light - Red light flashes when a recordable accident occurs and remains on for approximately 24 hours.**
- **Green light - Green light flashes unless a recordable accident occurs.**

LOCKOUT/TAGOUT



What Went Wrong?

This is a story of four people? Everybody, Somebody, Anybody, and Nobody. There was an important job to be done and Everybody was sure that Somebody would do it. Anybody could have done it, but Nobody did it. Somebody got angry because it was Everybody's job. Everybody thought that Somebody would do it, but Nobody asked Anybody. It ended up that the job wasn't done and Everybody blamed Somebody when actually Nobody asked Anybody.



Mechanical Lockout/Tagout

AUTHORIZED VS. AFFECTED EMPLOYEES

AFFECTED EMPLOYEES - An employee whose job requires him/her to operate or use a machine or equipment on which servicing is being performed under lockout/tagout, or any persons working in the immediate area.

AUTHORIZED EMPLOYEES - A person who locks out or tags out a piece of equipment or machinery in order to perform the servicing or maintenance on that machine.

CONDITIONS WHEN YOU SHOULD LOCKOUT A PIECE OF EQUIPMENT

- ➪ If you have to remove or bypass a guard.
- ➪ If part of your body can come in contact with the point of operation.
- ➪ If part of your body can come near an associated danger zone.

WHY DIDN'T I LOCK THIS THING OUT???
UUUHHHHHGGGGGG!!!!!

LOCKOUT PROCEDURE

1 **_Notify affected employees._**
2 **_Identify all energy sources._**
3 **_Place controls in the neutral/off position (start/stop button)._**
4 **_Neutralize all energy sources._**
5 **_Apply lock and tag._**
6 **_Test equipment by trying to start it._**
Return controls to neutral/off position.**
7 **_Perform work._**

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PROCEDURES FOR RE-ENERGIZATION OF A PIECE OF EQUIPMENT

1. Inspect machine for tools, make sure guards are in place, etc.
2. Notify affected employees of re-energization.
3. Ensure that controls are in the neutral/off position.
4. Remove lock and tag.
5. Restore power by returning disconnect to the “on” position.
6. Return controls to the “on” position.
7. Observe the equipment running to verify its safe operation.

END OF SHIFT PROCEDURE

SHIFTS OVERLAPPING

1. Notify your supervisor that servicing of the machine has not been completed.
2. Leave you lock/tag on the machine.
3. The ending shift supervisor will notify the on-coming supervisor of the locked out machine.
4. The on-coming supervisor will select an employee to complete work on the machine.
5. On-coming employee notifies all affected employees on that shift.
6. On-coming employee will attempt to operate machine to ensure it locked out and will not operate. Return controls to off position.
7. On-coming employee places lock/tag on energy isolating device.
8. Ending shift employee removes lock/tag from energy isolating device.

END OF SHIFT PROCEDURE
SHIFTS DO NOT OVERLAP

1. Notify your supervisor that servicing of the machine has not been completed.
2. The supervisor fills out the first half of an "END OF SHIFT LOCKOUT WORK ORDER" form, and signs the form.
3. Employee removes lock(s) and tag(s).
4. Supervisor place an "OUT OF SERVICE" lock and tag on the energy isolating device(s). A tag should also be put on the machine.
5. On-coming supervisor should check for outstanding end of shift lockout work orders.
6. Supervisor assigns employee to begin work on the downed machine.
7. The employee will complete the second half of the end of shift lockout work order with the supervisor present.
8. Employee places lock(s) and tag(s) on the machine and returns out of service locks and tags to the supervisor.
9. Both employee and supervisor must sign the end of shift lockout work order before work on the machine can begin.
10. Copy of the form will be given to the Safety Coordinator.

GROUP LOCKOUT/TAGOUT

1. The supervisor designates an employee to coordinate the group lockout procedure.
2. Designated employee will follow all steps of the lockout/tagout procedure.
3. Each person(s) working on the equipment will attach his/her lock to the energy isolating device(s).
4. Perform work.
5. When servicing is complete, each person removes his/her lock and tag and the group coordinator will follow all steps in the Equipment Re-energization procedure.

LOCK REMOVAL PROCEDURE

1. Only area managers and supervisors have the authority to remove a lock that has been left on a machine.
2. Must verify that the employee who applied the lock is not in the facility.
3. Make all reasonable efforts to contact the employee to tell of lock removal.
4. Ensure employee knows that lock has been removed prior to his/her returning to work.

WHAT HAPPENS IF AN EMPLOYEE FORGETS TO TAKE OFF HIS/HER LOCK?

- The employee will be retrained in lockout procedures.
- The employee may receive disciplinary action.
- The employee may be charged for a new lock out device.

Attachment B

Exercises for Lockout/Tagout training

Scenario 1

Needed:
- 2 locks
- 2 tags
- 1 lockout/tagout demonstration board
- 2 employees
- 2 supervisors

Press brake is down for set-up. Die must be changed out. Employee begins working on die change at 2:15 p.m. (employee is supposed to clock out at 2:30). Second shift begins work at 2:30 p.m.. 2:30 arrives and the employee is not finished making the die change. Employee informs supervisor that he/she is not finished making the die change. Implement **Lockout/Tagout** procedures for **End-of-Shift (shifts overlapping).**

Scenario 2

Needed:
- 2 locks
- 2 tags
- 1 Out-of-Service lock and tag
- 1 lockout/tagout demonstration board
- 2 employees
- 2 supervisors
- 1 End-of-Shift Lockout Work Order

Welder is down because the weld tips need changing. 2nd shift employee begins working on welder to change tips at 10:45 p.m. (employee is supposed to clock out at 11:00 p.m.). There is no 3rd shift. At 11:00 p.m. the employee is not finished changing the weld tips and is ready to clockout. Implement **Lockout/Tagout** procedures for **End-of-Shift (shifts not overlapping).**

Scenario 3

Needed:
- 4 locks
- 4 tags
- 1 group lockout hasp
- 1 lockout/tagout demonstration board
- 4 employees

Punch press is down. It needs the die changed, the brake adjusted, the oiler replaced, and the slug conveyor repaired. One employee is to change the die, 3 different maintenance technicians to work on the other three repairs. Implement **Group Lockout/Tagout** procedures.

Attachment C

MECHANICAL LOCKOUT/TAGOUT

Directions: Circle **T** if the statement is true or **F** if the statement is false.

1. T F The Point of Operation on a machine is the area where the employee is normally located.

2. T F Any time you remove a guard on a machine, it must be locked out before you remove it.

3. T F The first step an authorized employee does when locking out a machine is shut the power off.

4. T F It is not necessary to use a tag when locking out if your supervisor knows that you are servicing the equipment.

5. T F Affected employees are the same as Authorized employees.

6. T F During a group lockout, only one of the employees needs to attach his/her lock to the de-energizing source.

7. T F Lockout locks can only be used for lockout purposes.

8. T F ALL energy going to a machine that could affect your safety MUST be de-energized and locked out before you begin work on that piece of equipment.

9. T F Equipment Specific Lockout Procedures can be reviewed if you are unsure of how or where to lock out a machine.

10. T F It is acceptable not to lockout a piece of equipment if your supervisor says it is unnecessary.

11. T F It is acceptable for a supervisor to remove another person's lock only if that person has left the plant and all possible means to contact him/her has been attempted.

12. T F If an authorized employee forgets to take off his/her lock, the employee will be retrained in lockout procedures and may receive disciplinary action.

HAZARDOUS COMMUNICATION TRAINING

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[illegible]r Responsibility

- Read and follow instructions on product warning labels and MSDS.
- Use all necessary protective equipment.
- Follow the safe work practices given in training.

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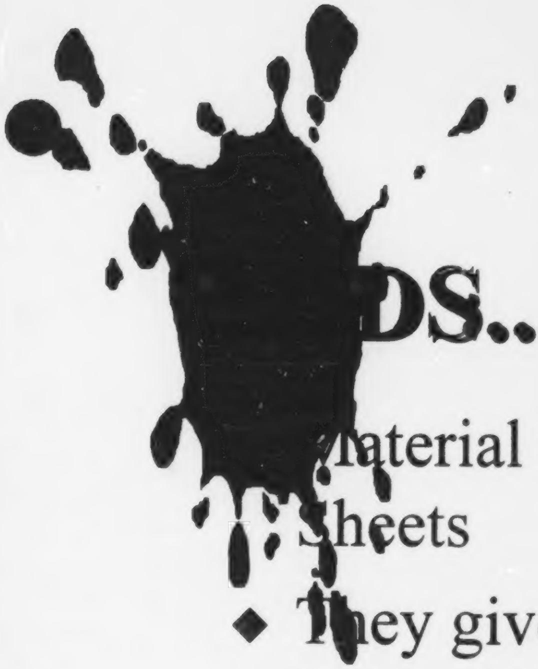

[illegible]DS...What Is It???

- Material Safety Data Sheets
- They give all of the information you would need to know about handling and potential hazards of chemicals you work with.

- Ask your Supervisor to see an MSDS sheet if you have any questions about a chemical.
- MSDS sheets are listed by the chemical company's name.

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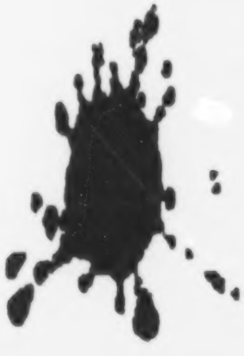
Common Sense

- Never mix chemicals that aren't properly labeled.
- Never assume an unlabeled container is harmless just because it isn't labeled.
- Never remove a label unless you immediately replace it with another one.



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[illegible]el :Tips

- Read the label on the container of every chemical you use.
- Check the MSDS whenever you need more information about how to control the material's hazard.
- Follow the instructions the label gives you.

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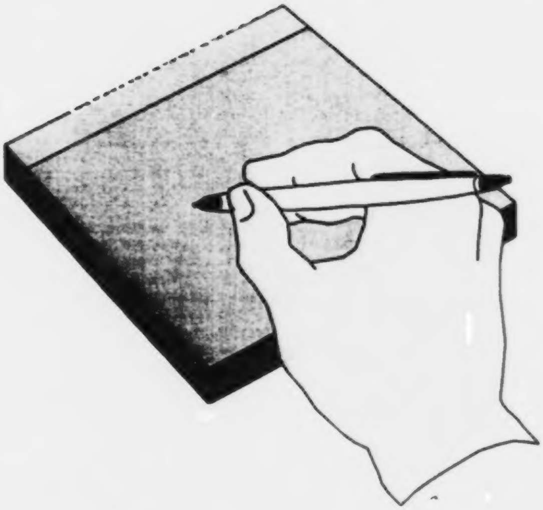
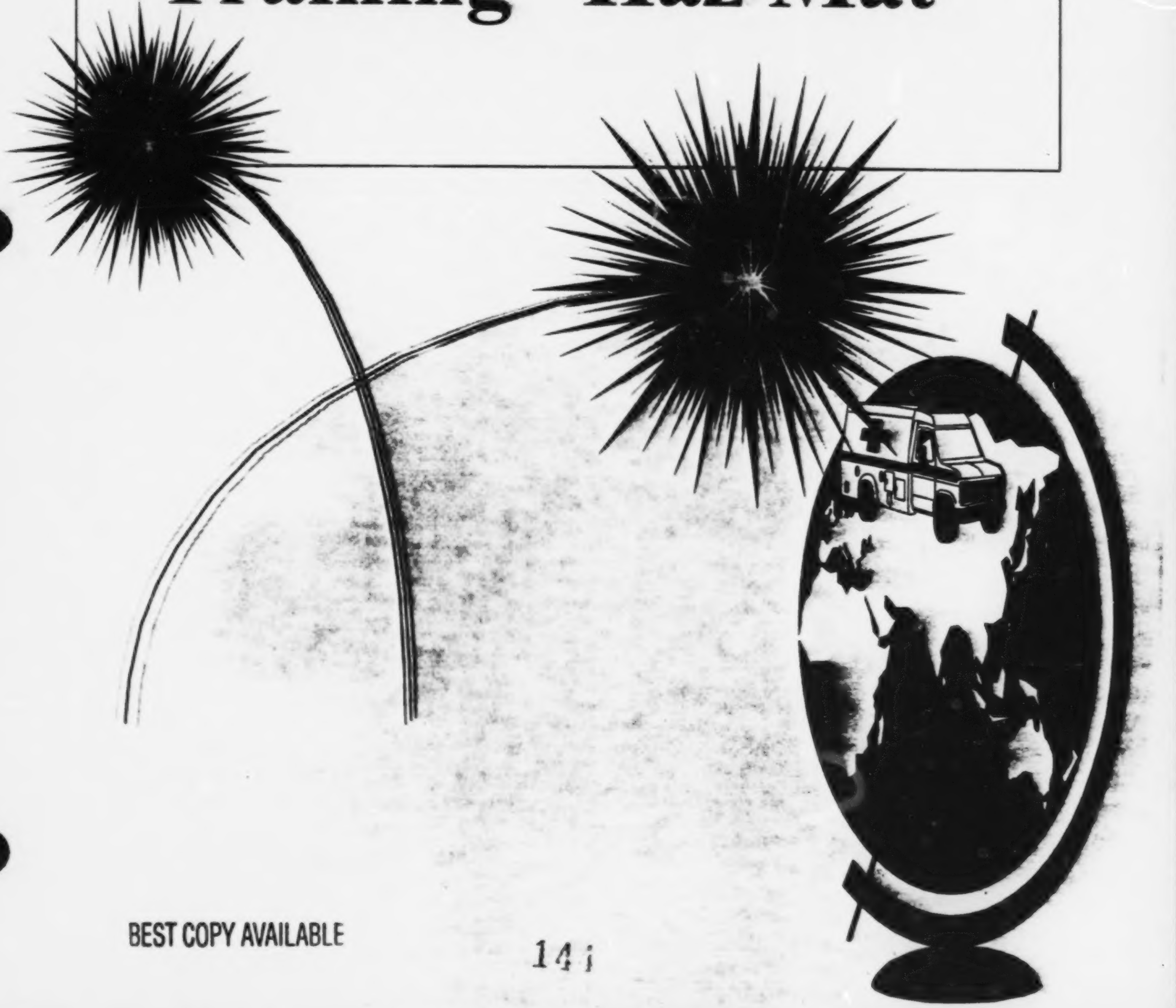
HAZARD COMMUNICATION WRITTEN PROGRAM

Copies of the Company Hazard Communication Program can be found with the Plant Safety Coordinator or in the Company Safety Policies and Procedures Manual.



Company Name
Hazardous Materials
Training "Haz Mat"



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LOZIER CORPORATION

Job Title: General/New Hires

Module: Hazardous Materials Training

General Instructional Objective: To stimulate awareness of hazardous materials.

Specific Instructional Objective: Learners will be able to identify potential material hazards and to contact the appropriate persons in case of emergency.

Motivational Activity:

Key Words:

Hazardous Communication (Haz Mat)
Security
Contingency Plan

Instructional Activity/Guided Practice: Instructor will use overhead transparencies to present hazardous materials information.

Independent Practice: Learners will complete hazardous material worksheet.

Evaluation: Instructor will check work completed independently for accuracy.

Security

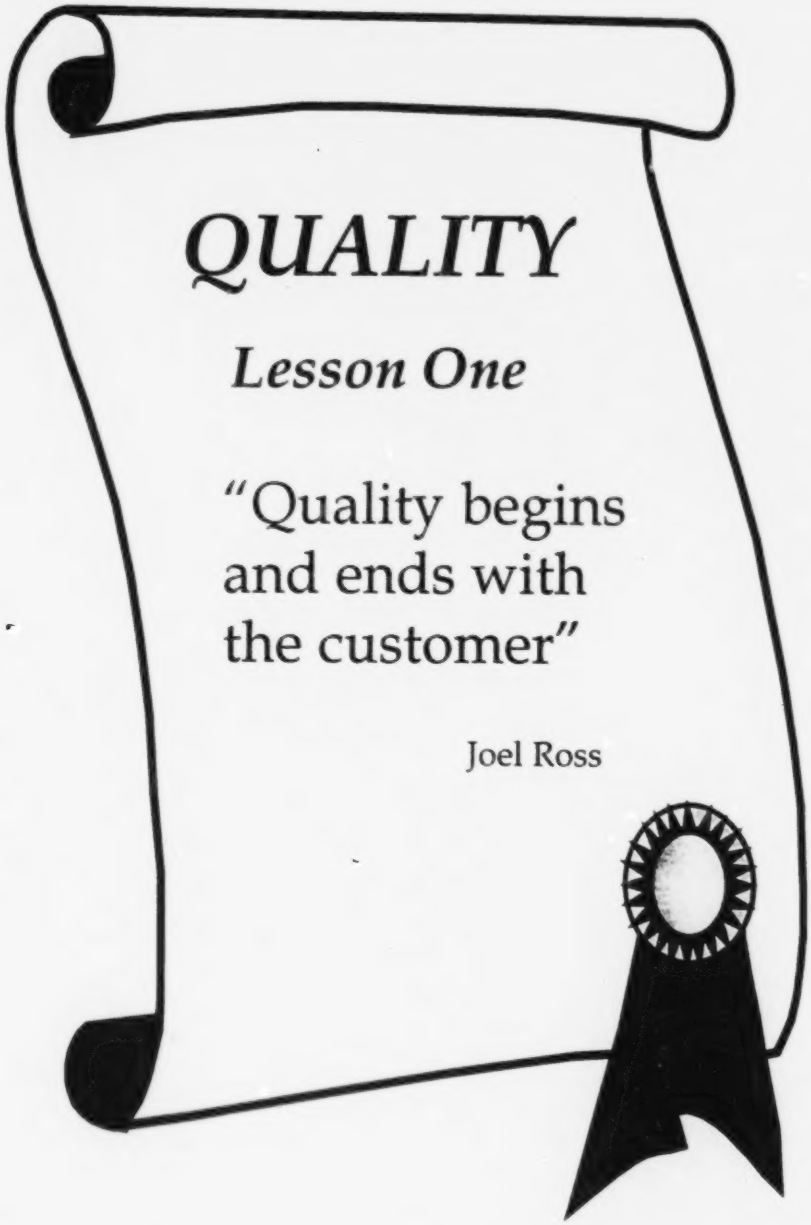
- Insert company security plan

Contingency Plan Purpose

- Establish guidelines for **responding to emergencies**.
- Assure safety of **human health**.
- Have **pre-planned strategies** with the fire dept., emergency medical personnel, & police.
- **Clean up and disposal** of waste
- Insure plant is **safe and secure**

The Container/Drum

- Shipable
- Remove previous labels
- Hazardous Waste and DOT labels
- Attach ground cable
- Cover and close containers
- Fill in date when full
- Clean



QUALITY

Lesson One

"Quality begins
and ends with
the customer"

Joel Ross

Module: Quality - Lesson One **Overall Time** 60 min.
Job Title: New Hires/General

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners should be able to do the following: (1) Understand the importance of quality control; and (2) Demonstrate proper completion of a reject tag with 100% accuracy.	**Motivational Activity:**. Instructor will write several questions on board to generate discussion of why the learners select certain products and services	5 min	Dry erase board and markers	Participation
	Vocabulary: Introduce unfamiliar words or terms.	5 min	Overhead projector, transparency (Attachment A)	Participation
	Instructional Activity: Present quality department mission statement followed by brief lecture on what quality means to the Lozier employee, the meaning of quality control, key points of the inspection process, and completion of reject tag..	15 min	Transparencies (Attachments B, C, D)	
	Guided Practice: Using flow chart, guide learners through the production process from start to finish.	10 min	Transparency (Attachment E)	Participation
	Independent Practice: Learners will read scenarios and provide solutions.	15 min	Attachment F	
	Closure/Evaluation: Learners will discuss answers to the scenarios.	5 min		Check for accuracy

Lozier Corporation

Job Title: New Hires/General

Module: Quality - Lesson One

General Instructional Objective: To introduce quality practices to the new employee and emphasize that quality is a priority at Lozier.

Specific Instructional Objective: Upon completion of this unit the learner should be able to: (1) Understand the importance of quality control; (2) Demonstrate proper completion of a reject tag with 100% accuracy.

Motivational Activity: Instructor will write several questions on the board to generate discussion of why the learners select certain products and patronize certain businesses. (Relate this to quality product, service, etc.).
Depending on makeup of the class, questions could include:

Do any of you own a Ford Truck? Why did you choose Ford?
What brand of jeans do you usually purchase? Why
Where do you usually buy groceries? Why

Vocabulary: Using overhead transparency, instructor will introduce any unfamiliar and/or key words in the lesson (Attachment A).

Instructional Activities: Instructor will present the Scottsboro Quality Department Mission Statement using an overhead transparency. This information is included in the learner's workbook as Attachment B. In the brief lecture, the instructor should place emphasis on what this quality policy means to the Lozier employee and the meaning of quality control (Attachment C). Using Attachment D (transparency provided), the instructor will go over key points of the inspection process. Instructor will explain use of a reject tag and how to properly complete one.

Guided Practice: Using the flow chart transparency (Attachment E in learner's notebook), instructor and learners will follow the Lozier Process from start to finish. Instructor should point out points of inspection indicated by circles.

Independent Practice: Learners will read scenarios (Attachment F) and provide solutions. Learners will demonstrate their understanding of reject tag by completing a tag using information provided in the scenarios. (This activity may be done in small groups.)

Closure/Evaluation: Learners will discuss their answers to the scenarios. Instructor will check for accuracy.

REFERENCES:

Compton's Interactive Encyclopedia, Compton's NewMedia, Inc., 1995.

Omachonu, Vincent K., and Joel E. Ross, Principles of Total Quality, St. Lucie Press, Delray Beach, FL, 1994

Quality

Product Quality is of utmost importance in our industry. Customers expect our products to be free of any visual defects as well as being strong and durable. Today's lesson is an introduction to quality control. You will receive more in-depth training in your area.

KEY WORDS

DEVIATION

DFT

DISPOSITION

FEEDBACK

GO/NO-GO GAUGES

MISSION STATEMENT

QUALITY STANDARDS

SERVICE

SPECIFICATIONS

Attachment A

Key Words

Deviation – Method of approving use of product that does not meet all specifications

DFT – Dry film thickness

Disposition – Selection of the necessary action to resolve non-conformance

Feedback – Response (positive or negative) concerning a process or product

Go/No-Go gauges – A gauge designed to measure specific dimensions

Mission Statement – The primary overall purpose of an organization and its expressed reason for existence. A mission statement should include the value that is being added and the direction the company intends to move.

Quality standards – Conformance to specific guidelines

Service – Meeting the needs of the customer (on-time delivery, best price, and quality product)

Specifications – Requirements specified by engineering/design

NOTE: This page was omitted because it contained Lozier specific information.

Quality

We are driven by the needs of our customers. Satisfying our customers requires quality service and quality products delivered as promised. Each employee is responsible for providing, and continuously improving, quality customer service.

To employees this means:

- **Product quality is equally important to the other priorities that concern our customers — low cost and on-time delivery.**
- **Specifications are set to satisfy customer needs and expectations.**
- **Specifications and quality standards are provided at each process.**
- **Employees are trained to understand customer expectations.**
- **It is each employee's responsibility to "shut down" a process that is not producing parts that meet our specifications.**
- **Everyone participates in improving customer satisfaction.**

Quality Control

Quality control is incorporated into most manufacturing operations. The department is usually set up to operate according to written procedures guided by a quality control manager.

What does quality control mean?

In the manufacturing industry, we define quality control as an organized effort to maintain a product to set standards by testing at various points during the production process.

How do we measure quality?

Tests are applied at several points during production of products. It would not be cost effective to wait until the product is finished to check for quality. If we wait until the product is finished to check tolerances, a great deal of money and material could be wasted. There is an old management saying, “If you can’t measure it, you can’t manage it.” So it goes with quality.

Why is quality so important?

Ultimately, our product must meet customer satisfaction and expectation. Product quality is equally as important to the customer as service and price.

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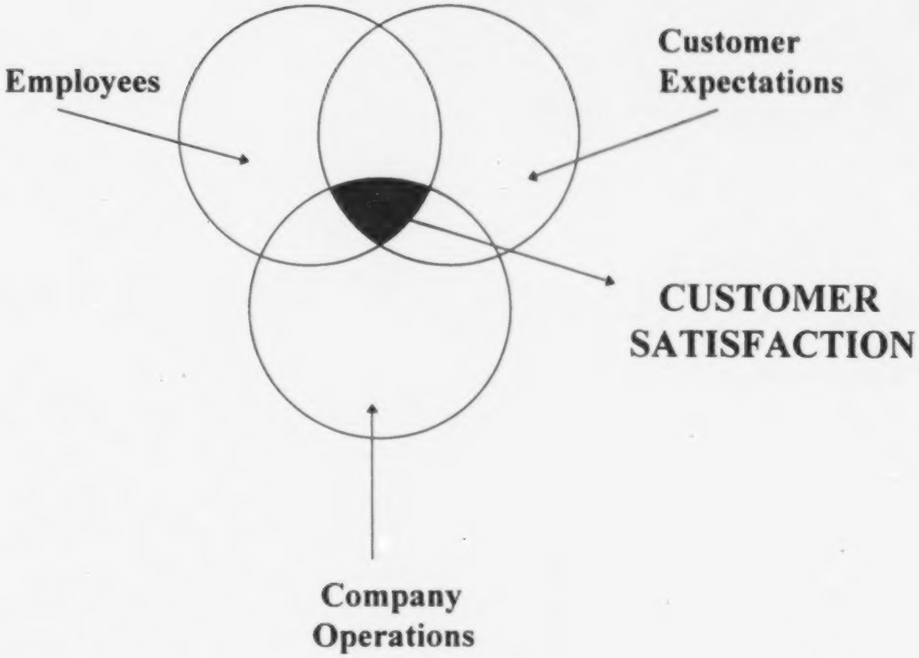


CUSTOMER SATISFACTION
A Three Part System

The effectiveness of the three-part system depends on how well these three factors are integrated.

Adapted from: Omachonu, Vincent K., Ross, Joel E., Principles of Total Quality Management, St. Lucie Press, Delray Beach, FL, 1994.

KEY POINTS OF THE INSPECTION PROCESS

- **HOW DO WE DEFINE QUALITY**
  - PRINTS / ENGINEERING STANDARDS (E.S'S)
  - VISUAL STANDARDS (Samples)
- **HOW DO WE MEASURE QUALITY**
  - BASIC MEASUREMENT
  - GO/NO-GO GAGES
  - DESTRUCTIVE TESTS
  - OTHER INSTRUMENTS (DFT, GLOSS AND COLOR)
- **HOW DO WE DOCUMENT QUALITY**
  - REJECT TAGS / NON-CONFORMANCE REPORTS
  - SCRAP REPORTS
  - CUSTOMER COMPLAINTS
- **WHAT DO WE DO WHEN DEFECTS OCCUR**
  - SHUT DOWN
  - CONTACT SUPERVISOR / QUALITY TECHNICIAN
- **HOW DO WE CONTROL DEFECTS**
  - REJECT TAGS
  - SEGREGATE NON-CONFORMING MATERIAL
- **CUSTOMER FEEDBACK**
  - CUSTOMER PROBLEM PROCESS (CUSTOMER COMPLAINTS)

Reject Tag

Directions for completing a reject tag.

Date: Current date

Written by: Person filling out reject tag

Error Dept.: Department where non-conformance occurred (Example: Shelving)

Location of Dept.: Example: Conveyor - PP3

Error Plant: SC (Scottsboro)

Shift: Example: 1st Shift

Part number: Part number of rejected item

Color: Examples: unfinished (if unpainted) or platinum, etc. (if painted)

Quantity: Total number of parts rejected before sorting out non-conforming parts

Found by operator: T (for true) if found by the operator
F (for false) if not found by the operator

Nature of defect: Write a description of the defect

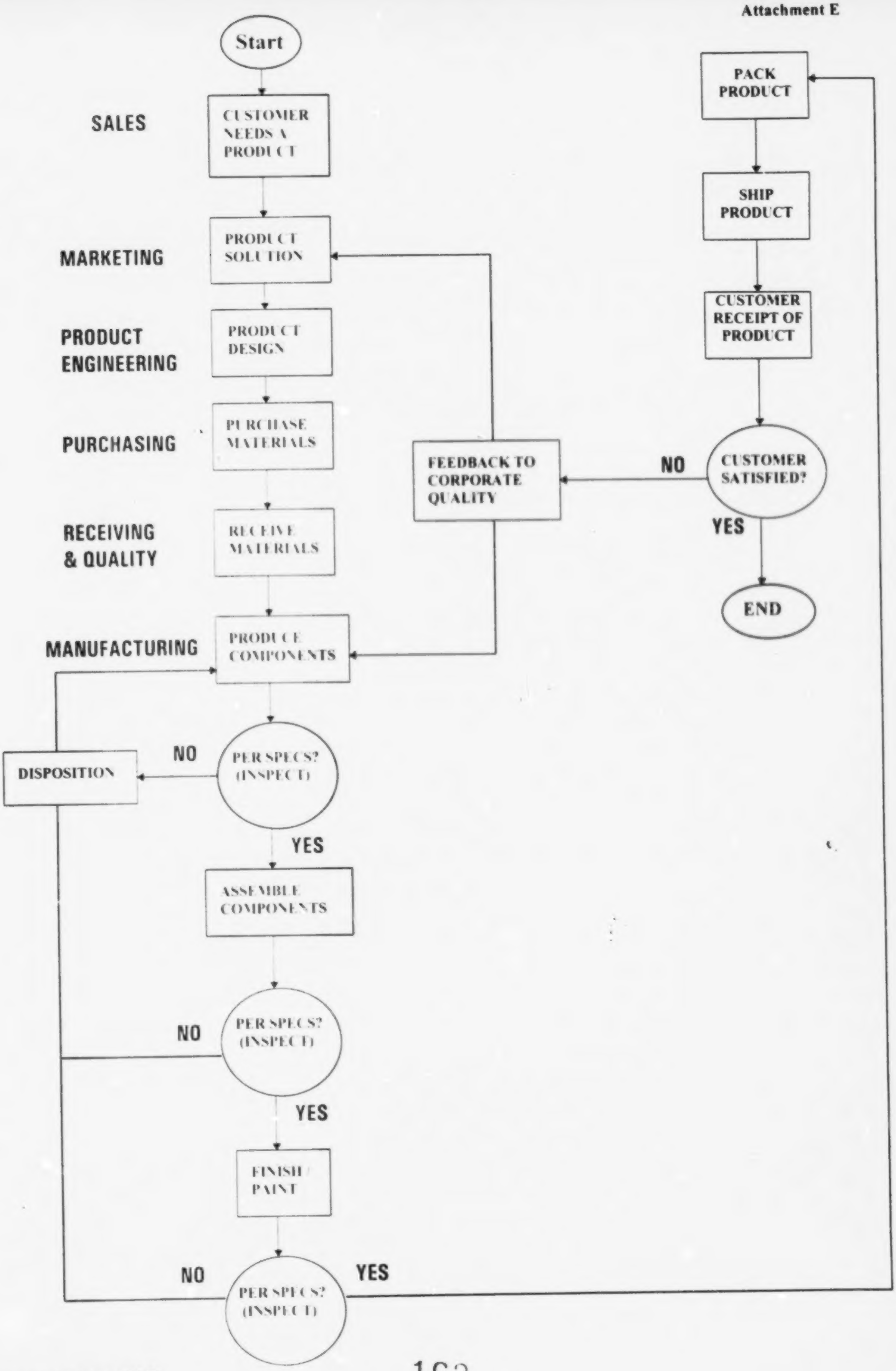
Disposition: This is usually completed by crew leader or supervisor. The supervisor and/or crew leader may decide to rework or scrap but never to "use as is".

Corrective action taken to resolve problem: This is usually completed by crew leader or supervisor. Write in this section the action taken to resolve the non-conformance.

Distribution of copies of a reject tag:

White	Quality department (QA)
Green	Production and Inventory Control (P&IC)
Pink	Supervisor
Yellow	Not used at this plant
Blue	Not used at this plant
Golden rod	Area Manager
Hard copy	Placed on product. (Hard copy is returned to QA after disposition has occurred.)

Attachment E



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Read the following scenarios and describe the results. Consider quality, delivery schedule, costs, etc. Complete a reject tag if necessary.

Scenario 1

A machine is set to bend tag molding at a certain angle. However, the machine is incorrectly set and no one measures to see if the tag molding is within tolerance. Later in the day, when the shift changes, the error is discovered. What happens to the shelves that are not within tolerance? How did this effect the cost?

Scenario 2

Paintline 1 has a large order for platinum shelves. Visual checks were made without using the color chips. At the end of the job it was discovered that the color was slightly off. What must be done to correct the problem? Analyze this situation and give two possible solutions.

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Read the following scenarios and describe the results. Consider quality, delivery schedule, costs, etc. Complete a reject tag if necessary.

Scenario 1

A machine is set to bend tag molding at a certain angle. However, the machine is incorrectly set and no one measures to see if the tag molding is within tolerance. Later in the day, when the shift changes, the error is discovered. What happens to the shelves that are not within tolerance? How did this effect the cost?

Rejected (Reject tag attached)
Sort the good from the bad parts
Scrap the bad parts
Good parts will continue through production process
New parts must be made to replace the non-conforming parts

Scenario 2

Paintline 1 has a large order for platinum shelves. Visual checks were made without using the color chips. At the end of the job it was discovered that the color was slightly off. What must be done to correct the problem? Analyze this situation and give two possible solutions.

(In most cases, a reject tag would not be completed in this situation.)

Two situations could occur:

1. Parts stay on conveyor and repainted without being taken off.
2. Take off line until proper color can be scheduled.

Quality

Lesson Two

- Operator's guide
- Packaging
- Scrap

Module: Quality - Lesson Two **Overall Time 60 min.**
Job Title: New Hires/General

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners should be able to: (1) locate scenarios in operator's guide; (2) demonstrate proper nesting procedures; and (3) identify types of scrap.	**Motivational Activity:**. Emphasize importance of proper labeling by displaying several items, some of which are improperly labeled. (Example: A box of pencils with a label stating the quantity is 12 pencils, but only 8 pencils are in the box.)	5 min	Items to demonstrate proper labeling (pencils, pens, clips, etc.)	Participation
	Vocabulary: Introduce unfamiliar words or terms.	5 min	Attachment B	Participation
	Instructional Activity: Instructor will discuss with class information presented on Attachments C, D and E in learners' workbooks.	15 min	Attachments C, D, and E	
	Guided Practice: Instructor will use class volunteers to demonstrate proper nesting procedure and visual inspection of fixtures.	15 min		Participation
	Independent Practice: Learners will complete Attachment F..	15 min		
	Closure/Evaluation: Learners will check answers for accuracy.	5 min		Check for accuracy

Lozier Corporation

Job Title: New Hires/General

Module: Quality - Lesson Two

General Instructional Objective: To provide new employees with knowledge of Lozier quality standards and procedures.

Specific Instructional Objective: Learners should be able to: (1) locate scenarios in operator's guide; (2) demonstrate proper nesting procedures; and (3) identify types of scrap.

Motivational Activity: Emphasize importance of proper labeling by displaying several items, some of which are improperly labeled. Example: (1) A box of pencils with a label stating the quantity is 12 pencils, but only 8 pencils are in the box. Ask the learners if they can determine if the quantity is correct without opening the box? (The pencils rattle, the box is light weight, etc.) Relate this example to improperly labeled shelves or uprites.

Vocabulary: Instructor will define and discuss key words in the lesson. Instructor should encourage participation from the learners during the discussion (Attachment B).

Instructional Activities: Instructor will discuss with class the information presented on Attachments C, D and E in learners' workbooks. This information includes: (1) overview of operator's guide; (2) quality in packaging; and (3) scrap procedures.

Guided Practice: Instructor will use class volunteers to demonstrate: (1) proper nesting procedure and (2) visual inspection of fixtures.

Independent Practice: Learners will work independently to complete Attachment F using Operator's Guide to find specific information.

Closure/Evaluation: Instructor will discuss the answers to the questions on Attachment F and check learners' responses for accuracy.

Attachment A

Quality

- ✓ Quality is everyone's business.
- ✓ Quality problems need to be addressed by the first person who sees them and handled appropriately.

Attachment B

KEY WORDS

Attributes -- A quality or characteristic; distinctive feature

Authorized document -- An approved document

Conforming -- To meet or exceed the minimum published standard, specification, or procedure

Frequency -- Number of occurrences

Nesting -- To put snugly together or inside one another (This is a procedure used in packing product to prevent damage in shipment.)

Non-conforming products -- Products that do not meet quality standards, drawings, specifications, and procedures

Segregate -- Mark, tag, or sort non-conforming items to separate them from conforming items

S.O.P. -- Standard Operating Procedure

Test equipment -- Qualified equipment for measuring quality standards

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Attachment C

Operations Guide

An Operations Guide provides essential information for each department. Becoming familiar with this manual is very important. When moving from one area to another, you will notice the information in the guide is different; however, the format is the same.

In this lesson we will look at the basic format of the Operations Guide. You will receive additional training in your area as to specific use of this manual.

Packaging as a Part of Quality

An important, but sometimes overlooked, part of product quality is the service connected with it. Good packaging, timely and accurate shipping, and the ability to meet deadlines matter as much as the quality of the product itself. A quality product must meet our customers needs. If the product is damaged or does not arrive in a timely manner, it is not a quality product.

NESTING

WHO DOES NESTING?

Employees on the paintline "nest" shelves for shipment. This technique is performed by those taking parts off the line and/or those packing the product.

WHY IS NESTING DONE?

"Nesting" is important in packaging shelves to prevent damage during shipment. The shelves are placed so that they fit snugly together. If the shelves do not nest properly, it is a result of either: (1) the procedure not being done correctly or (2) there is a dimensional problem with the product.

It is important that you learn the proper technique of nesting. You will receive "hands-on" training in your area.

WHAT ARE THE RESULTS OF PROPER "NESTING"?

- Allows for proper stacking and packaging
- Shelves are secure and free of movement during shipment
- Product is received by customer without damage

WHAT SHOULD YOU DO IF THE PRODUCT DOES NOT NEST PROPERLY?

- Call the crew leader or supervisor

LABELING

Proper labeling is a must! Always check the label for accuracy. Never "assume" that the label is correct. You should always check:

- The product
- The color
- The quantity

Why is labeling important?

- Our customers depend on receiving the color and quantity of product that was ordered.
- Our inventory accuracy depends on proper labeling.

Who is responsible for labeling?

All products ***must*** be packaged and ***labeled properly*** before going to the Distribution Center. Employees in the following areas are responsible for proper labeling of product:

- Paintlines
- Storage shelves
- Woodshop
- Backline

How is labeling performed?

1. Information provided on schedule (job number, part number, work order number, etc.)
2. Information entered into computer system
3. Labels printed automatically
4. Operator puts label on finished product

TIPS

Check the following:

Do items in the box rattle?
Does product fit the box properly?
Does the package close properly?

Always do visual checks!

Attachment E

SCRAP

Scrap is a ***quality issue*** and an ***accounting issue***. Quality focuses on **reducing** scrap and accounting focuses on **reporting** scrap correctly so that financially the company can understand where the losses occur.

How does Lozier define scrap?

Slugs and Trim — Some scrap will always occur when certain products are produced. For example: The small pieces punched from the metal during production are called "slugs". The pieces cut from product in the production process are called "trim". This scrap is accounted for in the Bill of Material and figured into the price of the product.

All Other — Scrap that occurs due to machine or operator error is referred to as "all other".

How is scrap reported?

- Reject tag
- Scrap log sheet

Scrap bins are located throughout the plant and are painted different colors for easy identification. The blue bins are designated "Slugs and Trim", the red bins "All Other Scrap", and the green bins are for "Trash". It is **very important** that scrap is placed in the proper bin.

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Using the WIDE SPAN CELL Operations Guide, answer the following:

Scenario One

Suppose we needed to know the procedure for accepting or rejecting items with dents, scratches, etc. located in non-visible areas. Where would we look?

Scenario Two

Suppose you are a Punch Press Operator. Where can you find an "In Process Inspection Plan -- Punch Press, Notcher"?

Scenario Three

Where would you find information on reject tags?

Using the WIDE SPAN CELL Operations Guide, answer the following:

Scenario One

Suppose we needed to know the procedure for accepting or rejecting items with dents, scratches, etc. located in non-visible areas. Where would we look?

1. Under Description, find "Dents/Scratches".
2. Under Document Number, find the document number (ES-10).
3. Under Revision/Date, check the revision date Rev. B4/1/86
4. Under Section, locate Section 5

Turn to Section 5 and locate Document number ES-10, Rev. B4/1/86.

Scenario Two

Suppose you are a Punch Press Operator. Where can you find an "In Process Inspection Plan - Punch Press, Notcher"?

1. Under Description, find "In-Process Inspection Plan - Punch press, Notcher".
2. Under Document Number, find the document number SC4100.2.2
3. Under Revision/Date, check the revision date Rev. A5/30/95
4. Under Section, locate Section 5

Turn to Section 5 and locate Document number SC4100.2.2, Rev. A5/30/95.

Scenario Three

Where can I find information on reject tags?

1. Under Description, find "Control of non-conforming products".
2. Under Document Number, find the document number SC4130.1
3. Under Revision/Date, check the revision date Rev. A4/22/96
4. Under Section, locate Section 9.

Turn to Section 9 and locate Document number SC4130.1, Rev. A4/22/96.

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Using the SHELVING CELL Operations Guide, answer the following:

Scenario One

Locate the section where information concerning Inspection, Measuring, and Test Equipment is found?

Scenario Two

What is the document number for Spotweld Specs? Locate the document.

Scenario Three

What is the description of document SC4100.2.2? Locate that document.

Using the SPECIAL E/D CELL Operations Guide, answer the following:

Scenario One

In what section is Process Control located? Locate that section.

Scenario Two

Locate the M.O.P for Press Brake B-7.

Scenario Three

Using document ES-1, find the purpose of the document.

INVENTORY TRANSACTION

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Module: **Inventory Transaction** **Overall Time 60 min.**
Job Title: **New Hires/General** **Page 1 of 2**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Specific Instructional Objective: Learners should understand importance of inventory transactions and be able to complete inventory transaction forms with 100 % accuracy.	**Motivational Activity:.** Display items needed to prepare biscuits recipe described in lesson. The milk carton will be empty. Demonstrate that the biscuits cannot be made because someone used all of the milk without making note of it.	5 min	Bag of flour, can of Crisco, and empty milk carton	Participation
	Vocabulary: Learners will complete vocabulary exercise (Attachment A) containing words found in the lesson. Use overhead transparency to discuss meanings of key words.	10 min	Vocabulary exercise (Attachment A), overhead projector and transparency	Check for accuracy
	Instructional Activity: Teacher will provide information on accurate records, inventory computer system, and inventory transactions.	10 min	Attachments B, C, and D	
	Guided Practice: Using the raw material flow chart (Attach. E), instructor will help learners to understand the inventory process.	5 min	Overhead projector and transparency (Attachment E)	

	Independent Practice: Learners will be divided into groups and given a box containing instructions and parts needed to complete an assignment.	10 min	Boxes containing instructions and parts needed to assemble an object.	Participation
	Closure: A spokesperson for each group will describe the problems (if any) that occurred when completing the group assignment. Teacher will lead discussion (using the guidelines on Attachment B) explaining why records must be accurate. Attachment F will provide possible outcomes for each scenario.	10 min	Overhead projector and transparency (Attachment B), Attachment F	Participation
	Evaluation: Learners will answer review questions (Attachment G).	10 min		Check for accuracy

LOZIER CORPORATION

Job Title: **General/New Hires**

Module: **Inventory Accuracy**

General Instructional Objective: Learners should understand the vital role of inventory transactions.

Specific Instructional Objective: Learners should understand the importance of inventory transactions and be able to complete inventory transaction forms with 100 % accuracy.

Motivational Activity: Display items needed to prepare biscuit recipe described in lesson. The milk carton will be empty. Demonstrate that the biscuits cannot be made because someone used all of the milk without making note of it.

Vocabulary: Teacher will use overhead transparency to discuss meanings of key words. Learners will complete crossword puzzle containing words found in the lesson.

Instructional Activity: Teacher will provide information on: (1) the importance of accurate records (Attach. B); (2) the computer system used in keeping accurate inventory records (Attach. C); and (3) inventory transactions (Attach. D).

Guided Practice: Using the Raw Materials Flow Chart (Attach. E), instructor will work with the learners to understand the inventory transaction process.

Independent Practice: Learners will be divided into groups and each group given a box. The boxes will contain the following:

Box A will be short two pieces.
Box B will contain all pieces needed to complete the assignment plus the two pieces needed in Box A.
Box C will contain only half enough material to complete the assignment.
Box D will contain the instructions and all the pieces needed to complete the assignment.

Closure: A spokesperson for each group will describe the problems (if any) that occurred when completing the group assignment. The teacher will point out that Group A could have completed their assignment if they had known the two missing pieces had been stored in Box B. Teacher will lead discussion (using the guidelines on Attachment B) explaining what results when inventory records are not kept accurately. Attachment F will provide possible outcomes for each scenario and may be used as teacher narrative. Distribute a copy of Attachment F at conclusion of discussion for participants' notebooks.

Evaluation: Learners will answer review questions (Attachment G). Teacher will check for accuracy.

KEY WORDS

Bill of Material

Make to order

Storage location

P&IC

Finished goods

Quick pick

Inventory auditor

Obsolete

Inventory

Raw material

Unit of measure

Mainframe computer system

Attachment A

KEY WORDS

Bill of Material
Make to order
Storage location
P&IC
Finished goods
Quick pick
Inventory auditor
Obsolete
Inventory
Raw material
Unit of measure
Mainframe computer system

Directions: Select the appropriate word.

1. ____________________ Material purchased from an outside supplier which is still in its original form.

2. ____________________ The "recipe" or amount of material needed for products to be made.

3. ____________________ A specified quantity (i.e. bundle, roll, box, piece).

4. ____________________ A large powerful computer serving the company as a whole.

5. ____________________ No longer in use.

6. ____________________ Product produced directly for a customer order (not for stock) and tied to a specific customer job and work order number.

7. ____________________ Items ready to sell to the customer.

8. ____________________ A storage system used in high volume areas to reduce inventory transactions by adding or deducting only full containers.

9. ____________________ One who examines records and checks quantities on hand for accuracy.

10. ____________________ Acronym for Production and Inventory Control.

11. ____________________ The quantity of goods or material on hand.

12. ____________________ The specific floor or rack area where product is stored consisting of two alphabet characters (zone xx) and six numeric characters (aisle/rack/tier).

Attachment A
Answer Sheet

KEY WORDS

Bill of Material
Make to order
Storage location
P&IC
Finished goods
Quick pick
Inventory auditor
Obsolete
Inventory
Raw material
Unit of measure
Mainframe computer system

Directions: Select the appropriate word.

1.	Raw material	Material purchased from an outside supplier which is still in its original form.
2.	Bill of Material	The "recipe" or amount of material needed for products to be made.
3.	Unit of measure	A specified quantity (i.e. bundle, roll, box, piece).
4.	Mainframe computer system	A large powerful computer serving the company as a whole.
5.	Obsolete	No longer in use.
6.	Make to order	Product produced directly for a customer order (not for stock) and tied to a specific customer job and work order number.
7.	Finished goods	Items ready to sell to the customer.
8.	Quick pick	A storage system used in high volume areas to reduce inventory transactions by adding or deducting only full containers.
9.	Inventory auditor	One who examines records and checks quantities on hand for accuracy.
10.	P&IC	Acronym for Production and Inventory Control.
11.	Inventory	The quantity of goods or material on hand.
12.	Storage location	The specific floor or rack area where product is stored consisting of two alphabet characters (zone xx) and six numeric characters (aisle/rack/tier).

Attachment B

WHY MUST RECORDS BE ACCURATE?

Accurate inventory balances are needed to:

- **Make valid planning possible**
- **Maintain satisfactory customer service**
- **Determine replenishment of individual items (Should we make or buy more?)**
- **Release production authorizations (Are the materials available?)**
- **Analyze inventory (Do we have too much?)**

Inaccurate inventory records can result in:

- **Lost sales**
- **Shortages**
- **Excesses**
- **Missed schedules**
- **Low productivity**
- **Late delivery**
- **Excessive expediting**
- **Excessive freight costs**

Inaccurate inventory records lead to over ordering which causes:

- **High inventories**
- **High obsolescence (obsolete)**

Keeping Track

Inventory Transaction - *IT'S A MUST!*

(Insert how orders are received, entered, and tracked.)

Bill of Material

The amount of material needed is determined by the Bill of Material for products to be made. The Bill of Material is similar to a recipe used to make biscuits.

Bill of Material Vs Recipe

Bill of Materials:	Recipe:
Item: 1 Storage Shelf	Item: 10 Biscuits
6 Lb. Steel Sheet	1/4 Cup Shortening
2 X 4 Ft Particle Board	4 Cups Self Rising Flour
	1 Cup Buttermilk

Raw Material

Raw material inventory is any material or product not ready to sell to the customers. Examples include: coils of steel, bands of cardboard, slitted metal, individual brackets, hatch channels, uprites and shelves before they are painted.

When an order is received, the computer knows the Bill of Material and automatically checks the raw material supply to see if it is sufficient to make the orders placed. If there is not enough raw material inventory on hand, then purchasing is notified and an order is placed with a supplier.

Problems?!?

Problems arise when the information in the computer is incorrect. If the computer information indicates we have enough steel to make 5,000 shelves and we actually have enough to make only 1,000 shelves, then we will not be able to make the product for the customer as promised.

The above example demonstrates the importance of accurately entering information into the computer system. ***Employees are responsible for the accuracy of the information.*** In manufacturing areas, the accurate reporting of raw material usage is most important to support this process.

It is ***your*** responsibility to let the computer system know when you use raw material. This is accomplished by completing an **inventory transaction.** The computer is only as accurate as the information that is entered!

Inventory Transaction

Inventory transaction means **documenting when raw material changes location or is used with other materials to make a product**. This is done in two basic ways:

1. Remove inventory card and place in the transaction box.

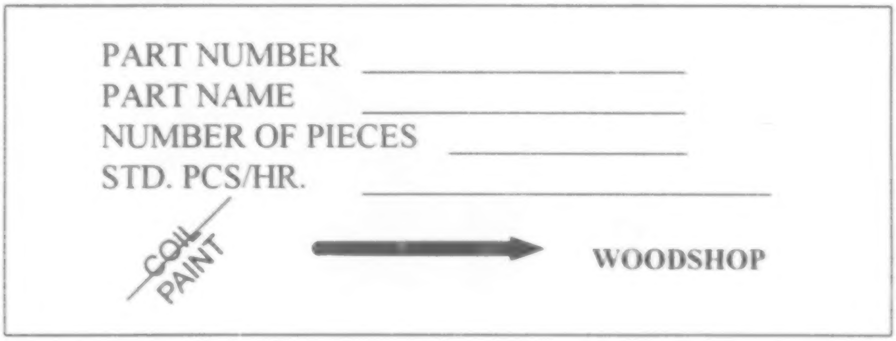
   or

2. Record the amount of inventory moved on a transaction form and place in transaction box.

Most raw material has an inventory card on it similar to the example below. This card will have the part number, part name, number of pieces, STD. PCS/HR and an arrow describing the movement of the product on it.

Inventory Transaction Card

Example:



PART NUMBER ____________________
PART NAME ____________________
NUMBER OF PIECES ______________
STD. PCS/HR. _________________________

COIL
PAINT → **WOODSHOP**

(Insert routing of inventory transaction card)

If the material does not have an inventory card, an inventory transaction form will need to be completed. These forms are available from your supervisor or any inventory auditor.

Inventory Transaction Form

The following information will need to be filled out on the inventory transaction form.

(Insert company information)

Remember if you are moving material to another department, you will need to make sure that you complete two inventory transactions.

**ANY TIME YOU MOVE
RAW MATERIALS
FOR ANY REASON**

**IT MUST BE
TRANSACTED**

Attachment E

Raw Materials Flow Chart

(Insert company raw materials flow chart.)

TAPE MEASURE
&
FRACTION APPLICATIONS

DIVISION

MULTIPLICATION

SUBTRACTION

ADDITION

Module: **Fractions Applications/Tape Measure** **Overall Time 60 min.**
Job Title: **New Hires/General** **Page 1 of 1**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners should know parts of a tape measure and understand how to use one properly. Learners should also be able to solve problems involving fractions with 90% accuracy.	**Motivational Activity:**. Using Lego™ building blocks, demonstrate the importance of accurate measurement.	5 min		
	Vocabulary: Instructor will display key words on an overhead and discuss meanings (Attach. A).	5 min	Overhead projector, Attach. A	Discussion
	Instructional Activity: Instructor will discuss importance of accurate measurements and the parts, use, and care of a tape measure.(Attach. B, C, D).	15 min	Attach. B, C, and D	
	Guided Practice: Instructor will assist learners in measuring several different Lozier parts.	10 min	Lozier parts	
	Independent Practice: Learners will: measure Lozier items and record answers; complete exercise on reading tape measure (Attach.F). Learners will apply knowledge of fractions in solving Lozier specific problems (Attach. G, H).	20 min	Lozier parts Attachments E, F, G, and H	Participation
	Evaluation: Check answers.	5 min		Check for accuracy

LOZIER CORPORATION

Job Title: New Hires/General

Module: Fraction Applications/Tape Measure

General Instructional Objective: Learners should be able to properly use a tape measure to obtain accurate measurements at work and when doing home projects. Learners should also be able to solve measurement problems using knowledge of fractions.

Specific Instructional Objective: Learners should know parts of a tape measure and understand how to use one properly. Learners should also be able to solve problems involving fractions with 90% accuracy.

Motivational Activity: Using Lego™ building blocks, demonstrate the importance of parts being exact size in order to have a perfect fit. Emphasize the importance of accurate measurement.

Vocabulary: The instructor will display key words on an overhead (Attachment A). Define each word and give an example of the word if applicable.

Instructional Activity: Instructor will discuss the importance of accurate measurement at Lozier (Attachment B). Instructor will discuss the parts, use, and care of a tape measure (Attachment C). Instructor will provide learners with instruction on reading a tape measure (Attachment D).

Guided Practice: Instructor will assist learners in measuring several different Lozier parts.

Independent Practice: Learners will use tape measure to measure several Lozier items and record their answers Attachment E). Learners will complete measurement worksheet (Attachment F). Learners will apply knowledge of fractions by solving Lozier specific problems (Attachment G and H).

Closure/Evaluation: Discuss answers record when measuring Lozier items. Check answers to Lozier specific problems for accuracy.

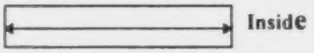
Attachment A

KEY WORDS

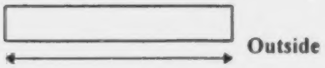
Calibrate – To check, adjust, or standardize systematically the graduations of a measuring instrument.

Increment – The amount or degree by which something changes.

Inside measurement – The inside dimension of two parallel sides.



Outside measurement – The outside dimension of two parallel sides.

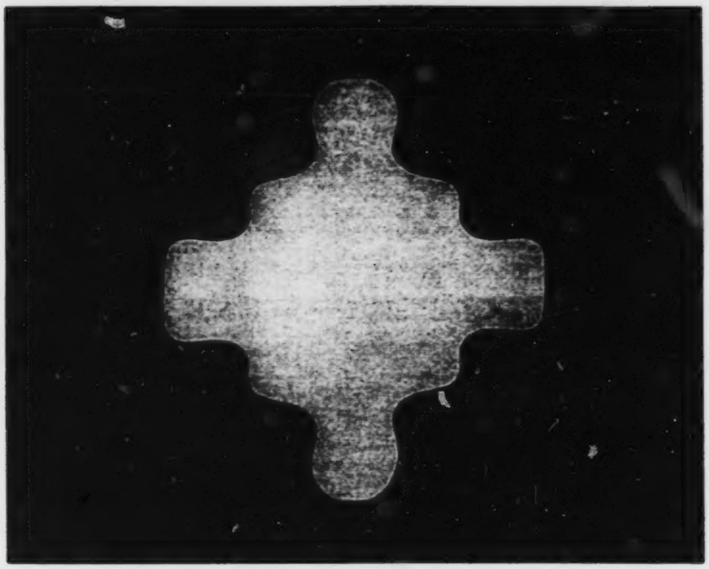


Parallel lines – Lines that are always equally distant from each other.

Riveted – Secured by a metal pin (or rivet).

Tolerance – The amount of variation from the desired or specified size that is permitted.

Tape measure – A narrow strip of steel tape marked off in units for measuring.



Just as all pieces of a puzzle must fit together, the products we manufacture and sell ~~at Lozier~~ to our customers must also fit. The measurement of our product is a very vital part of this puzzle. Each piece must be measured accurately in order to fit. If a customer orders uprites for 24 inch shelves and receives 22 inch shelves, the shelves will not fit. The product is often returned at our expense, or we must expedite the right product to them, sometimes disrupting our regularly scheduled product. One can see what an impact accurate measurement and packaging have on our product. Even though your job may be attaching channels to storage shelves or packing the same product all day, your job and/or function is a very important part of this puzzle.

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TAPE MEASURE

Do not attempt to tighten the hook at the end of your tape measure. It's a precisely calibrated part of the function of the tape measure!

Using the Hook

Have you noticed that the hook on the end of a tape measure is loose? The hook is loosely riveted to the metal tape through slotted holes that allows it to move back and forth. This was designed to allow an accurate "zero" setting for both inside and outside measurements.

Example:
When measuring a 24-inch shelf, you would place the hook on the end of the shelf and *pull* the tape. This "stretches" the hook out, leaving the *inside* of the hook even with the end of the shelf and with "zero" on your tape measure. However, suppose you needed to measure a wall where the shelf will be installed. You would *push* the tape which "squeezes" the hook so its *outside* is even with the wall and with "zero".

Using the case

The length of its case is marked on the side of every tape measure. A typical statement is: "Add 2 in. to inside measurements". Some tapes will indicate the size between two dimension arrows (←——2 in.——→).

The case of a tape measure is also used to take an inside measurement. Suppose you needed to measure the width of the upstairs walkway leading to the training rooms. You would place the hook on the outer edge of the walkway and *pull* the tape. The case would be placed against the wall. You would add the measurement of the case to the last number on your tape.

Helpful Hint: *Tape cases are 2, 2¼, 3¼, 3½, or 4 inches in length. When purchasing a tape, look for one with a 2, 3, or 4-inch case. This eliminates adding fractions when taking inside measurements!*

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Locks

On some tape measures, you must manually apply the lock or brake either by moving a slide or pushing a button located on the case. To release, you press the button or move the slide in the opposite direction.

Another type of tape measure locks when you stop pulling the tape out of the case. The bottom of the case is a lever which you press to release the tape. The tape rewinds when you press the release lever.

Special Markings

Tool companies try to make their tape measures as easy as possible to use. One way they do this is to highlight key dimensions. Usually, there is a special mark at each foot, such as a different color numeral, or a box around the number. Standard locations for building studs (the uprights used in building a wall) are also highlighted. Some tape measures are marked in *feet and inches* as well as *inches*. (Example: 48 inches will be marked 48" as well as 4 ft.)

NOTE:
Tape measures issued at Lozier measure in 32nd increments and must be checked for accuracy periodically by the quality department.

CARE OF TAPE MEASURE

RULE 1: Take care to see that your tape measure isn't stepped on.
More tape measures are ruined by being stepped on than any other cause.

RULE 2: Keep the tape clean.
Try to avoid getting sand, dirt, grease or moisture on your tape.

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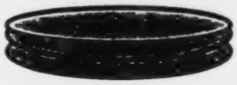
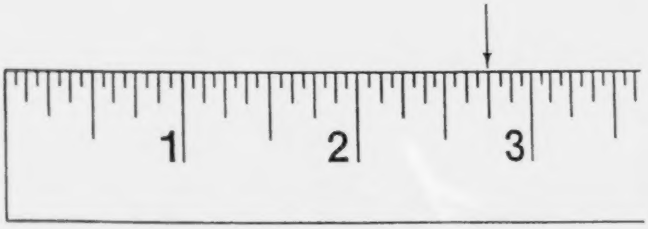
Did you know???

One sixteenth of an inch is about the thickness of a penny.



One eighth of an inch is approximately the thickness of two pennies.



The arrow points to $2\frac{3}{4}$ inches. This is the same as $2\frac{6}{8}$ inches and the same as $2\frac{12}{16}$ inches. The first reading is preferred.

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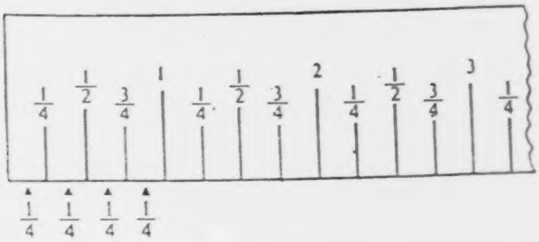
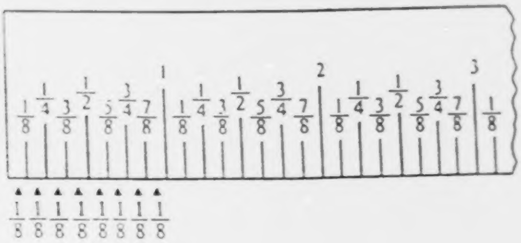
Reading A Tape Measure

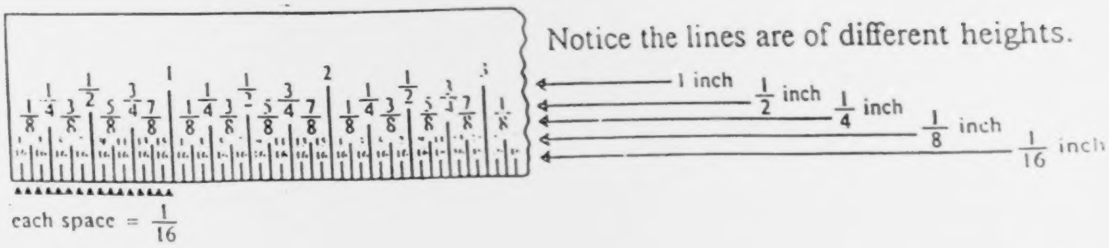
A. If each inch is divided into 4 spaces, each space is $\frac{1}{4}$ inch.



B. If each inch is divided into 8 spaces, each space is $\frac{1}{8}$ inch.

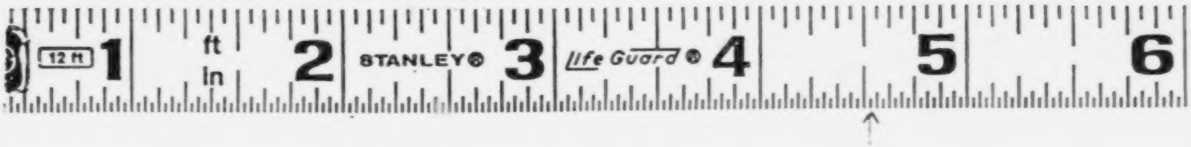


C. If each inch is divided into 16 spaces, each space is $\frac{1}{16}$ inch.


Notice the lines are of different heights.

Source: Essential Mathematics for Life, Four Edition, Glencoe/McGraw-Hill, NewYork, NY, 1995.

Linear Measurement

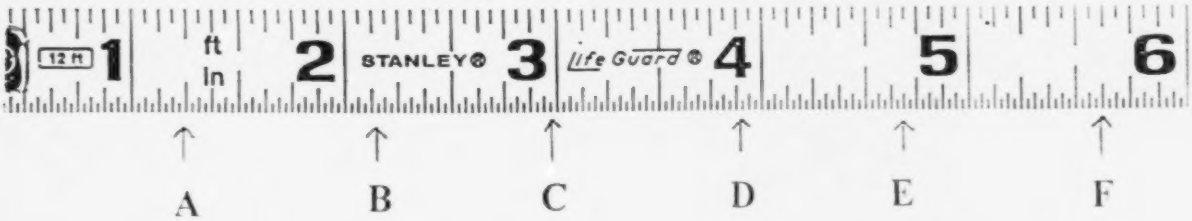


To what increment is the arrow pointing ________________.

Helpful Hint:

Locate $4\frac{1}{2}$ (Remember $4\frac{1}{2} = 4\frac{16}{32}$)

Add one more increment. Answer: $4\frac{17}{32}$



To what increments are the arrows pointing?

A. ________________

B. ________________

C. ________________

D. ________________

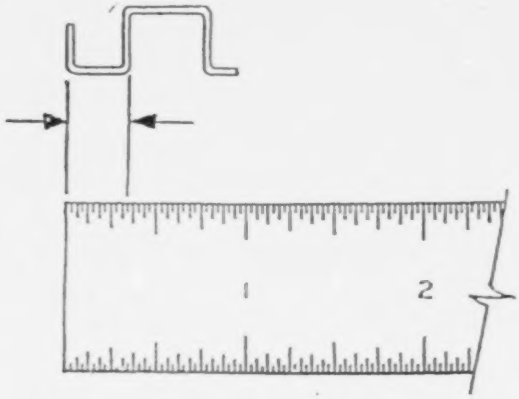
E. ________________

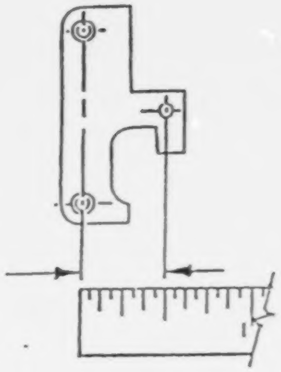
F. ________________

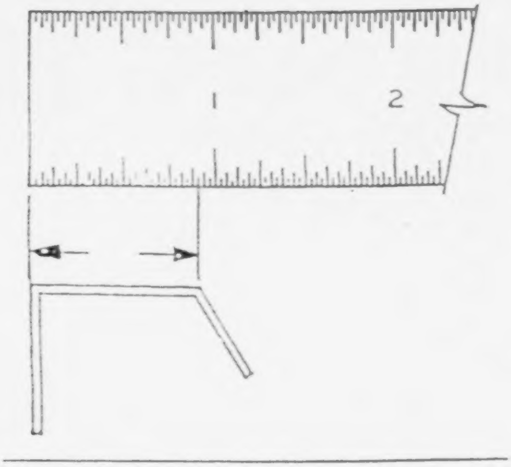
Attachment E

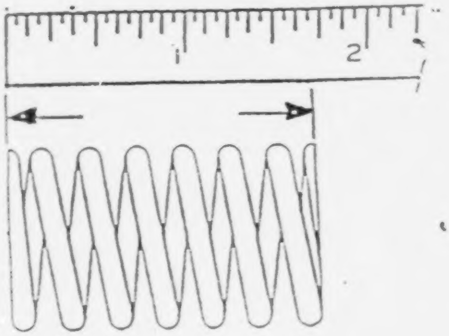
WORKSHEET

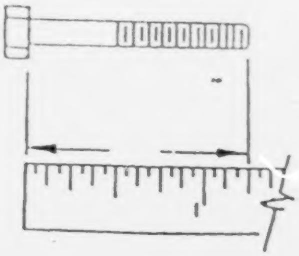
Read each measurement between arrows and record answers on line provided below each diagram. Reduce answers to the lowest terms.

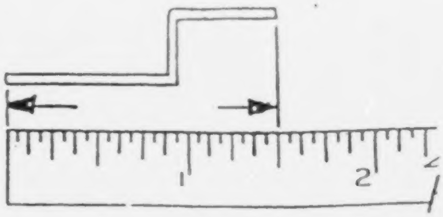












Read the following and solve the problems. Reduce fractions to the lowest terms.

1. Scottsboro Alabama, received 1¼ inches of snow on Thursday, 1½ inches on Friday, and 3½ inches on Saturday. What was the total amount of snow that fell in the 3 day period?

   ____

   How much more snow fell on Saturday than on Thursday?

   ____

2. Sixteen employees on second shift are enrolled in a training class. On Tuesday afternoon, $\frac{1}{8}$ of the employees were not in class. How many people were in class on Tuesday afternoon? ______________

3. If the dimension of a product on a blueprint is $3\frac{1}{2}$ and the actual measurement of the product is $3\frac{7}{16}$, what is the difference in the two measurements? __________

   If the tolerance for the product is $\pm\frac{1}{32}$, is the measurement within tolerance? ___________

4. If the dimension of a product on a blueprint is $4\frac{13}{16}$ and the actual measurement of the product is $4\frac{3}{4}$, what is the difference in the two measurements? ____________

   If the standard tolerance is $\pm\frac{1}{32}$, is the measurement within tolerance? ________________

5. A paintline employee checking the tolerance of a shelf found that the shelf measured $47\frac{15}{16}$ inches long. If the standard tolerance is $\pm\frac{1}{32}$, is the shelf acceptable as a 48-inch shelf?

   ____

   Approximately how many feet long is the shelf?

   ____

Attachment G
Page 1 of 2

Check the tolerances. Use the standard tolerance of $\pm\frac{1}{32}$.

Print Dimension	Minimum Tolerance	Maximum Tolerance	Actual Measure	Is Measure within Tolerance?
1. $5\frac{9}{16}$			$5\frac{19}{32}$	
2. $1\frac{3}{4}$			$1\frac{11}{16}$	
3. $9\frac{7}{8}$			$9\frac{3}{4}$	
4. $17\frac{23}{32}$			$17\frac{21}{32}$	
5. $4\frac{15}{16}$			$4\frac{31}{32}$	
6. $3\frac{1}{2}$			$3\frac{9}{16}$	
7. $2\frac{3}{8}$			$2\frac{1}{2}$	
8. $6\frac{5}{16}$			$6\frac{4}{16}$	
9. $1\frac{5}{32}$			$1\frac{1}{8}$	
10. $2\frac{17}{32}$			$2\frac{1}{2}$	
11. $3\frac{1}{2}$			$3\frac{7}{16}$	
12. $2\frac{5}{8}$			$2\frac{14}{16}$	
13. $4\frac{7}{16}$			$4\frac{1}{2}$	
14. $1\frac{3}{32}$			$1\frac{1}{8}$	

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Print Dimension	Minimum Tolerance	Maximum Tolerance	Actual Measure	Is Measure within Tolerance?
15. $5\frac{1}{4}$			$5\frac{8}{32}$	
16. $6\frac{1}{8}$			$6\frac{5}{32}$	
17. $3\frac{3}{8}$			$3\frac{6}{16}$	
18. $4\frac{13}{16}$			$4\frac{3}{4}$	
19. $5\frac{29}{32}$			$5\frac{7}{8}$	
0. $1\frac{5}{32}$			$1\frac{1}{8}$	

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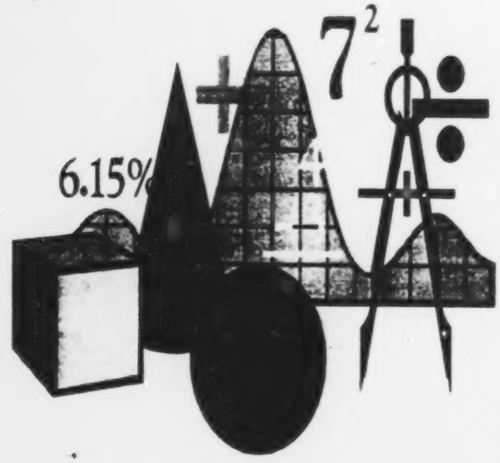
INTRODUCTION
TO
MEASURING
INSTRUMENTS



Module: Introduction to Precision Measuring Instruments Overall Time 60 min.
Job Title: New Hires/General Page 1 of 1

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners will recognize various measuring instruments and measure several parts using these instruments with 100% accuracy.	**Motivational Activity:**. Brown bag containing various instruments and bottle of soft drink will be displayed on the table. Instructor will remove utensils one at a time discussing how each might be used.	5 min	Brown paper bag filled with screw driver, bottle opener, pizza cutter, etc. and a bottle of soft drink.	Discussion
	Vocabulary: Instructor will display vocabulary words on an overhead and discuss meanings (Attach. A).	5 min	Overhead projector, Attach. A, caliper, micrometer, and protractor	Discussion
	Instructional Activity: Instructor will lead discussion on use and care of measuring instruments. Instructor will explain reading decimals and converting decimals to fractions.	15 min	Attachments. B, C, D, caliper, micrometer, and protractor	
	Guided Practice: Instructor will assist learners in completing worksheet on decimals (Attach. D, p. 1-3).	5 min	Attach. D	Observation

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
	Independent Practice: Learners will: (1) complete table on converting fractions to decimals and percents (Attach. D, p. 4), (2) measure displayed Lozier items independently or in groups (Attach. E), (3) complete crossword puzzle (Attach. F).	20 min	Attachments D, E, and F	Check for accuracy
	Evaluation: Check answers on Attach. D. Discuss answers recorded when measuring items.	10 min		

LOZIER CORPORATION

Job Title: New Hires/General

Module: Introduction to Precision Measuring Instruments.

General Instructional Objective: Learners will identify and recognize the proper use and care of various measuring instruments.

Specific Instructional Objective: Learners will recognize precision measuring instruments (caliper, micrometer, and protractor) and measure several parts using these instruments with 100% accuracy.

Motivational Activity: A brown bag containing various instruments (screw driver, vegetable peeler, bottle opener, pizza cutter, etc.) and an unopened bottle of soft drink will be displayed on the table. Instructor will remove utensils one at a time discussing how each might be used. Ask could it be used to open the soft drink bottle. Remove bottle opener last and relate the fact that all the utensils are useful but only the bottle opener would be effective in opening the soft drink bottle. Instructor will lead discussion on the necessity of using the proper measurement tools at work.

Vocabulary: The instructor will display vocabulary words on an overhead (Attachment A). Define each word and give an example of the vocabulary word if applicable. Teacher may choose to use flip chart to record responses.

Instructional Activity: Instructor will demonstrate the correct usage of a caliper, micrometer, and protractor (Attachment B). Instructor will reinforce the proper procedures necessary in handling and maintaining measurement tools (Attach. C). Instructor will review decimals, making sure learners understand place value (Attach. D).

Guided Practice: Instructor will assist learners in completing worksheet on decimals (Attachment D, p. 1-3).

Independent Practice: Learners will (1) complete table on converting fractions to decimals and percents (Attachment D, p. 4), (2) measure displayed Lozier items independently or in groups (Attachment E), and (3) complete crossword puzzle (Attachment F).

Closure/Evaluation: (1) Learners will be provided a completed equivalencies table to check their answers (Attachment D). (2) Discuss answers recorded when measuring displayed items and reinforce importance of accurate measurement. If answers vary, measure items again for accuracy. (3) Provide answers to crossword puzzle.

Attachment A
Transparency

KEY WORDS

Accuracy – the state of being exact

Angle – two straight lines that meet at a point (the symbol for angle is ∠)

Caliper – instrument used to verify product dimensions (inside and outside)

Degrees – units of angular measurement (the symbol for degree is °)

Dimensions – any measurable extent, length, width, thickness

Increment – amount or degree by which something changes

Measurement – a unit or standard for determining extent, volume, or quantity

Micrometer – precision instrument used to measure small distances, depth, and thickness.

Precision – accurate or exact.

Protractor – instrument used to measure or lay out angles on drawings

Tolerance – the allowable deviation or change from a standard

Attachment A

KEY WORDS

Accuracy – the state of being exact

Angle – two straight lines that meet at a point (the symbol for angle is $\angle$)

Caliper – instrument used to verify product dimensions (inside and outside)

Degrees – units of angular measurement (the symbol for degree is °)

Dimensions – any measurable extent, length, width, thickness, etc.

Increment – amount or degree by which something changes

Measurement – a unit or standard for determining extent, volume, or quantity

Micrometer – precision instrument used to measure small distances, depth, and thickness.

Precision – accurate or exact.

Protractor – instrument used to measure or lay out angles on drawings

Tolerance – the allowable deviation or change from a standard

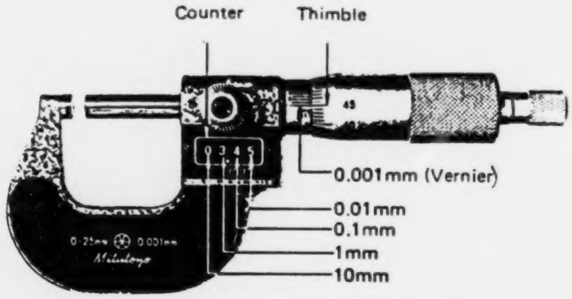
Introduction to Measuring Instruments

To insure quality, some measurements must be very precise. These measurements require a tool more precise than a tape measure.

The greater the degree of precision required, the more precise measuring instruments must be used. The three precision measuring instruments commonly used at Lozier are the caliper, micrometer, and protractor. Measurements taken with these instruments are generally expressed as decimals.

Micrometer

The micrometer is used to measure items requiring accuracy to the "one thousandth" and at Lozier the readings are in decimals.



Micrometers are used at Lozier to measure the gauge of steel. This takes place most often in the coil line and brackets area. The micrometers are provided by the quality department and are located at a station in the department where they are used.

Caliper

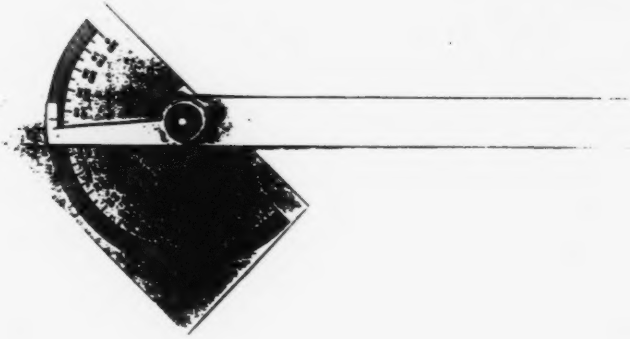
The caliper is a device used for contact measurement. It consists of two movable metal legs. There are outside, inside, and combination instruments that measure inside and/or outside dimensions.

- Outside calipers have inward-pointing contacts and are designed to close around the outside of the piece to be measured.
- Inside calipers, used to measure the inside of an enclosed space, have legs that point out.
- Combination tools have two sets of contact legs.

Lozier generally uses 6 inch calipers. A few 12 inch calipers are available in the Quality Department. Calipers are available at stations located on the plant floor mainly in the metals department. Calipers are used to verify the length and width of Lozier parts (especially brackets and shelving).

Protractor

Protractors are used to measure angles. Lozier uses beveled protractors. These can measure an angle from 0° to 180°. Employees use protractors to measure the angles of tag molding on Lozier shelving. Tag molding has specific angle regulations dictated by the Americans with Disabilities Act (ADA) and customers. Protractors are available at stations in the department where they are used or in the Quality Lab.



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Guidelines for Handling Measurement Tools

Before measuring an item, be certain to "zero out" the precision instrument. Refer to the specific instructions from your instrument manufacturer to zero the read-out.

- It is critical to check the calibration date before using.
- It is critical to check the tool for damage before using.
- Do not toss or throw any precision measurement tool.
- Clean the tool with a soft cloth after each use.
- Always store the tool in it's case when not in use to protect it from dirt and other hazards.
- For care and accuracy, always use two hands when handling precision instruments.
- Never place precision instruments on running machines.
- Remember to return tools to their station. Other people will be using the same tools.

Key Points of Precision Measurements

- Scales and all other measuring tools must be used accurately.
- Measurement tools must be calibrated periodically.
- Although the quality department is responsible for calibrating instruments, all operators must check calibration expiration dates.
- If a tool "seems off", have it checked, regardless of calibration date.

Understanding Decimals

Most of us use decimals on a daily basis. In our money system, a decimal point separates dollars from cents. Numbers after the decimal point represent a value ***less than one dollar***.

Example: $1.00 $.50 (less than one dollar)
← →

Our number system uses the decimal point to separate ***whole numbers*** from numbers with a value ***less than 1.***

The number of digits following the decimal point tells you how small the decimal value is.

Look at the **place value chart** below. (Notice the words to the right of the decimal point end in ***ths***.)

9	,	8	5	4	.	2	3	7
thousands		hundreds	tens	ones		tenths	hundredths	thousandths

In what place is the 4? _________ In what place is the 3? _________

Decimal values can go much further than the thousandths place, however, in most cases you will not need to use values less than a thousandth.

*Your answers to the above questions were correct if you said the 4 is in the **ones** place and the 3 is in the **hundredths** place!*

Source: Frenchette, Ellen Carley, Math Solutions - Decimals, Fractions, Ratios, and Percents, New Readers Press, Syracuse, NY, 1995.

Reading Decimals

To read a decimal number, use your knowledge of place values.

Reading a Decimal:

Example: How would you read the number **.685**?

Step 1

Read the number just as you would read a whole number. *Six hundred eighty-five*

Step 2

Read the place value of the *last* digit on the right. The last digit in the number is a 5. It is in the *thousandths* place.

The number is read as **"six hundred eighty-five thousandths."**

Use the place value chart to fill in the blanks below.

In the number 7,890.254 what digit is in the following places:
a. tens place? _____
b. tenths place? _____
c. hundredths place? _____
d. ones place? _____

In the number 4,056.29 what digit is in the following places:
a. tens place? ______
b. tenths place? ______
c. hundredths place? ______
d. ones place? ______

Have you ever thought of money as decimals? For example, $.01 is a penny, and $.10 is a dime, $1.00 is a dollar. Place value is very important!

Source: Frenchette, Ellen Carley, Math Solutions - Decimals, Fractions, Ratios, and Percents, New Readers Press, Syracuse, NY, 1995.

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Converting Fractions to Decimals

Fractions and decimals both show part of a whole. To write a decimal as a fraction, put the ***part*** over the ***whole***.

Example: What fraction of a dollar is 25¢?
Look at the place value of the decimal. .2 5 is twenty-five ***hundredths***.

tenths
hundredths

$$.25 = \frac{25}{100}\ \begin{matrix}\textbf{Parts}\\ \textbf{Total parts}\end{matrix} = \frac{1}{4}$$

Try writing these decimals as fractions. Reduce to lowest terms.

.1	.10	.5	.750	.85
_____	_____	_____	_____	_____

At times you may need to work with decimals instead of fractions. To convert a fraction to a decimal, divide the numerator by the denominator.

Example: $1/8 = 8\overline{)1.00}$

Try writing these fractions as decimals.

$\frac{2}{3}$	$\frac{1}{16}$	$\frac{1}{32}$
_____	_____	_____

Equivalencies

Decimals, Fractions, and Percents

DIRECTIONS: Fill in the blanks with the correct decimal, fraction, or percent.

Decimal	Fraction	Percent
.1	$\frac{1}{10}$	10%
.2	$\frac{1}{5}$	20%
.25		
		30%
	$\frac{1}{3}$	
.4		
		50%
	$\frac{3}{5}$	
.666 or $.66\frac{2}{3}$		
		70%
.75		
.8		
		90%
1.0		

Attachment E

MEASUREMENT ANSWER SHEET

Directions: Measure the displayed Lozier parts with the proper measuring tool and record your answers below. Use the chart on qualified measuring equipment at the bottom of the page to identify which tool to use.

	Instrument	Measurement		Instrument	Measurement
1.			7.		
2.			8.		
3.			9.		
4.			10.		
5.			11.		
6.			12.		

QUALIFIED MEASURING EQUIPMENT

DIMENSIONAL REQUIREMENTS	MEASUREMENT EQUIPMENT
.001" TO .015"	Calipers (all sizes) Micrometers (all sizes) Depth Gages Coordinate Measuring Machines
.015" TO .031"	Combination Squares Steel Rules
.031" AND OVER	Tape Measures
.5 AND OVER	Protractor

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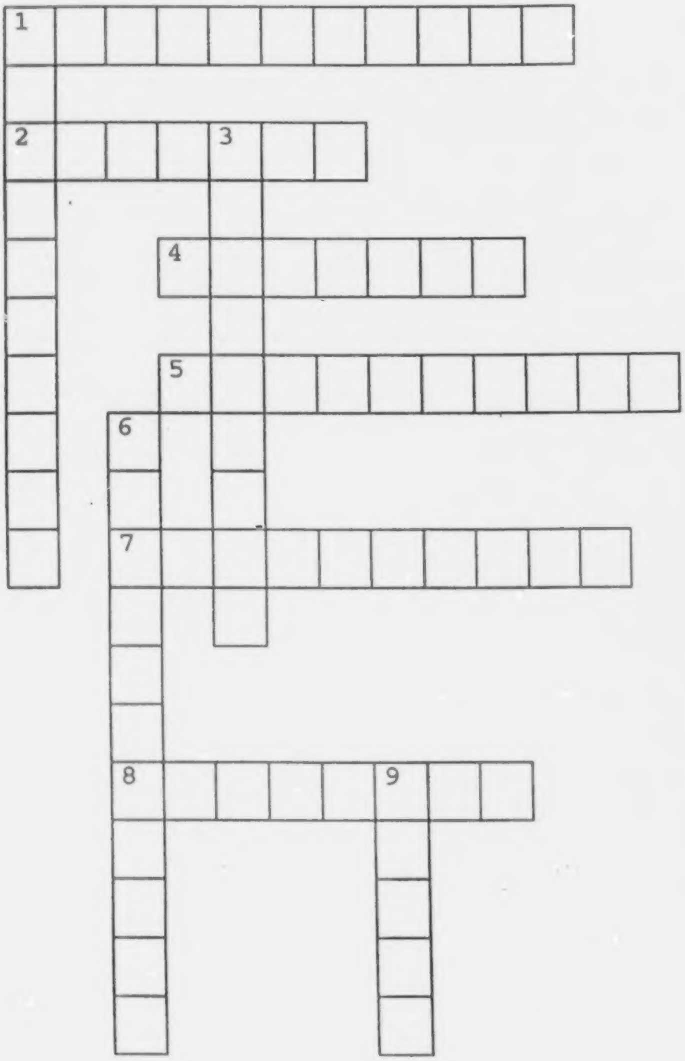
Attachment F

Crossword Puzzle

Directions: Using the clues provided, work the crossword puzzle.



Attachment F

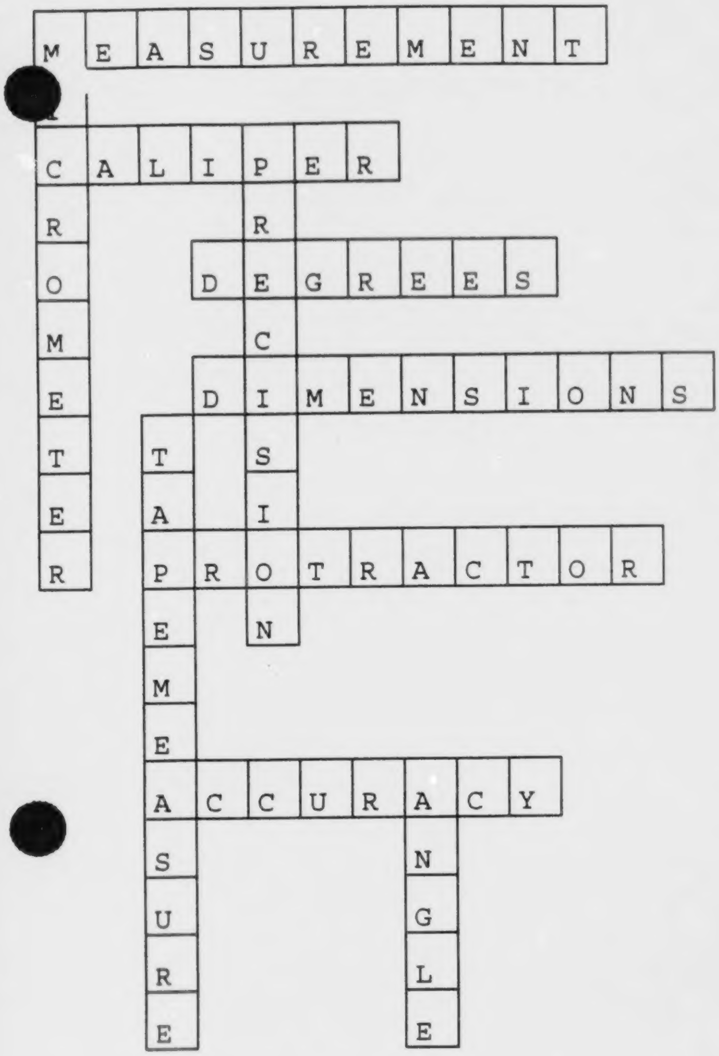
Clues

ACROSS

1. **A unit or standard for determining extent, volume, or quantity**
2. **Instrument used to verify product dimensions (inside and outside).**
4. **A unit of angular measurement.**
5. **Any measurable extent, length, width, thickness, etc.**
7. **Instrument used to measure or lay out angles on drawings.**
8. **The state of being exact.**

DOWN

1. **Precision instrument used to measure small distances and angles.**
3. **To be accurate or exact.**
6. **A narrow strip of steel tape marked off in units for measuring (two words).**
9. **Two straight lines that meet at a point.**


MEASUREMENT
MICROMETER
CALIPER
PRECISION
DEGREES
DIMENSIONS
TAPEMEASURE
PROTRACTOR
ACCURACY
ANGLE

INTRODUCTION
TO
BLUEPRINTS

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Module: **Introduction to Reading Blueprints** **Overall Time 60 min.**
Job Title: **New Hires/General** **Page 1 of 1**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners will identify specific areas and symbols on a blueprint with 100 % accuracy.	**Motivational Activity:**. Ask for volunteers to give directions from the plant site to a particular place in town. Teacher will write the directions on the board and draw a map from one location to another.	5 min	Dry erase board, markers	Participation
	Vocabulary: Discuss meaning of vocabulary words (Attachment A).	10 min	Overhead projector, Attachment A	Participation
	Instructional Activity: Teacher will lead discussion on reading blueprints (Attach. B).	15 min	Attachment B	
	Guided Practice: Teacher will guide learners in locating information on blueprints (Attachment C).	15 min	Attachment C	Participation
	Independent Practice: Complete blueprint activity (Attachment D).	10 min	Attachment D	Participation
	Evaluation: Discuss completed activity.	5 min	Attachment D	Check for accuracy

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LOZIER CORPORATION

Job Title: General/New Hires

Module: Blueprint

General Instructional Objective: Familiarize learners with interpreting reading blueprints. Emphasis will be placed on the parts of and data on a blueprint.

Specific Instruction Objective: Learners will identify specific areas and symbols on a blueprint and complete worksheet activity with 100 % accuracy.

Motivational Activity: Ask for volunteers to give directions from the plant site to a particular place in town. Teacher will write the directions on the board. Then, draw a map from one location to another. Teacher will lead discussion on how much easier it is to visualize the locations when they see it diagrammed.

Vocabulary: Instructor and learners will go over and discuss the meaning of vocabulary words: (Attachment A)

ANSI
Detail Drawing
Notes
Blueprint
Scale
Tolerance
Visualize
Title
Interpret
Revision

Instructional Activity: Teacher will lead discussion on the importance of blueprints. Discuss how attention to detail might help them on their job. Relate how blueprints (as well as maps, directions, instructions, etc.) make various tasks easier and more accurate (Attachment B).

Guided Practice: Teacher will use overhead transparencies to guide learners in locating information on blueprints (Attachment C, pages 1- 4). Ask questions and have learners find the information on the drawing (relate knowledge gained in previous lesson on tolerances). Explain that blueprints will help them visualize how the parts will look when they are finished. Explain that blueprints are all different but they should all contain the basic information.

Independent Practice: Learners will use provided blueprints (for classroom use only) to complete activity (Attachment D). Note: Laminated copies of Lozier blueprints of parts familiar to paintline and storage shelving area employees could be provided for use during class and taken up for reuse in other classes.

Closure/Evaluation: Discuss completed activity.

Attachment A

GLOSSARY

ANSI – Acronym for American National Standards Institute. Standard sizes were developed for blueprints so that they could be universally interpreted by any industry. The standards set uniform sizes and locations for information that describes the part.

Blueprint – A detailed drawing which provides information as to what the object will look like when it is complete.

Detail Drawing – A drawing of a single part that provides all the information necessary in the production of that part.

Hold – Dimension that must be maintained; tolerance very low.

Interpret – To look at a drawing and understand what you see on paper.

Notes – Instructions and information that supplement a drawing.

Revision – Changes made in a print.

Run out – Material growth; not a critical dimension

Scale – The relationship of the size of the blueprint to the size of the actual object. Remember that the dimensions are always the exact size no matter what the scale.

Title – Name or description of a drawing.

Tolerance – The amount of variation allowed from the desired or specified size.

Visualize – To get a mental picture of the shape and size of an object by looking at a blueprint or drawing.

BLUEPRINT:

A reproduction of an original engineering drawing that is used by workers to manufacture a part or product.

BLUEPRINT DRAWINGS
The Language of Industry

The language of industry and science is "drawings". The men and women of industry who build products should know how to read engineering drawings.

It is easy to learn to read blueprint drawings, which today is the closest means to a universal form of communication known to man. Remember, to be an effective communicator is to tell someone something in a way he/she can understand it. Blueprints are made up of many different parts, each with a specific function. In the following pages we will examine the parts of a blueprint that you may encounter in your department.

In today's world, drawings are used in every industry. Whether it is the manufacturing of store fixtures, cars, clothing, steel, tires, or houses, nearly everything is produced from a drawing. Learning to read drawings will help you to better understand and perform in the ever changing world of industry.

Reading a Blueprint

Blueprint reading is the gathering of information from a blueprint. It involves two principle elements: visualization and interpretation.

Visualization is the ability to "see" or envision the size and shape of the object from a set of blueprints. **Interpretation** is the ability to look at and understand lines, symbols, dimensions, and the other information on a print.

Care of Blueprints

Blueprints and related specification sheets are as important as the tools you use. With proper care, blueprints can be kept usable for a long period of time.

Rules of Care You Should Observe

- Never write on a print unless you have been authorized to make changes.
- Keep prints clean and free of oil and dirt. Soiled prints are difficult to read and contribute to errors.

Information Found on a Lozier Blueprint

- Part to be manufactured, dimensions, and notes (manufacturing and packaging)
- Material
- Title of the drawing and part
- Drawing number
- Manufacturer's name
- Tolerances
- Scale of the drawing
- Drafter and date (designer, engineer, checker)
- Revision Information

TITLE BLOCK

The organization of the information may differ from print to print, but the following information will be consistently provided.

1. **Name** - Lozier Store Fixtures

2. The **page number** is used when there is more than one sheet or page to the print.

Examples:

1 of 1

PAGE 2 OF 3

3. The **drawing number** is used to identify the blueprint.

Examples:

DRAWING NO.
21055-01

DRAWING NO.
21328

4. The **title of the drawing** identifies the part or assembly and is followed by descriptive modifiers. The title is read by saying the modifiers' first. For example LEG, UPRITE, would be read UPRITE LEG.

NOTE: Attachment C pages 3-5 have been omitted from the generic curriculum due to the nature of their content. These pages contained Lozier specific information concerning blueprint materials and would not pertain to other companies. Information relating to the particular company should be inserted here.

LOZIER CORPORATION

Scottsboro, Alabama

GENERAL/NEW HIRES FACILITATOR'S MANUAL

Alabama Partnership for Training

TABLE OF CONTENTS

I. **OVERVIEW AND ASSESSMENT**
    A. Program Explanation
    B. Explanation of APT Program
    C. Preview assessment

II. **SAFETY ONE**
PERSONAL PROTECTIVE EQUIPMENT
    A. Lozier safety and health policy
    B. PPE guidelines
    C. Appropriate clothing
    D. General safety rules
    E. Independent practice
        1. True and False
        2. Crossword puzzle

III. **SAFETY TWO**
HEAT STRESS AND BACK INJURIES
    A. Three major heat disorders
    B. Factors effecting and controlling heat stress
    C. Safety guidelines to prevent back injuries
    D. Independent practice
        1. Worksheet
        2. True and False

IV. **SAFETY THREE**
EVACUATION AND HOUSEKEEPING
    A. Emergency evacuation procedures
        1. Fire/Non-weather related emergencies
        2. Tornado/weather related emergencies
    B. Review of blueprint of facility
    C. Scenarios that could arise in the event of an emergency.
    D. Housekeeping expectations
    E. Guidelines to reducing injuries related to slips, trips, falls
    F. Independent practice
        1. Matching exercise
        2. Crossword puzzle

V. INTRODUCTION TO LOZIER - ONE

- A. Lozier History
  - 1. Past - Present - Future
  - 2. Purpose - Mission - Vision
- B. Defining our business
  - 1. Top Lozier customers
  - 2. Top Lozier - Scottsboro customers
- C. Independent practice
  - 1. Matching exercise
  - 2. Worksheet

VI. INTRODUCTION TO LOZIER - TWO

- A. Key production mindset
- B. Lozier measurements
- C. Organization chart review
- D. Understanding Scottsboro support departments

VII. FRACTIONS REVIEW

- A. Adding and Subtraction
- B. Multiplication and Division
- C. Independent Practice

VIII. INTRODUCTION TO MEASURING INSTRUMENTS

- A. Definition of caliper, micrometer, protractor, tape measure
- B. Guidelines for using and handling measurement tools
- C. Independent Practice
  - 1. Measuring Lozier parts
  - 2. Crossword puzzles

IX. BLUEPRINTS

- A. Definition of a blueprint
- B. Information found on a blueprint
- C. Language of blueprint drawings
- D. Reading and care of blueprints
- E. Title Blocks
- F. Independent Practice
  - 1. Activity using Lozier blueprint
  - 2. Worksheets

X. INVENTORY TRANSACTION

XI. QUALITY/REJECT TAGS

XII. COMMUNICATIONS - ONE

XIII. COMMUNICATIONS -TWO

XIV. QUESTION & ANSWER SESSION

- A. Review
- B. Post Assessment

OVERVIEW
AND
ASSESSMENT

ALABAMA PARTNERSHIP FOR TRAINING

Lozier Training and Development

OVERVIEW

As employers and employees prepare for the 21st Century, one fact remains certain - both the workplace and the skills needed to meet the demands of the technically oriented environment are changing. Recent surveys of American industries show that employers are looking for employees who possess higher levels of reading, computation, communication, and reasoning skills.

Continuously, workers are confronted with rising basic and technical skill requirements to meet the demands of an ever-changing global economy. As technology changes the American workplace, workers must acquire the higher level skills needed to perform all facets of the production process. The worker of the 21 Century must possess the skills necessary to utilize technology, evaluate information, and deal effectively with human relations matters. The basic skills that were once sufficient for assembly line production are insufficient for workers in the technically changing work environment.

The Alabama Partnership for Training is a program funded in part, through a $2.6 million U. S. Department of Education National Workplace Education grant. This grant was applied for and received by the State Department of Education. Hundreds of applications from all over the United States were submitted to the U.S. Department of Education but less than 40 were approved. Industries throughout the state expressed interest in participating in the program. Lozier was selected to participate as a partner in the program. Fieldcrest Cannon Rug Mill in Scottsboro is also participating in the program. Other industries currently participating include: Michelin Tire, Dothan, AL; Standard Furniture, Bay Minnette, AL; O'Neal Steel, Birmingham, AL; Southern Ductile, Bessemer, AL; UAW Chrysler, Huntsville, AL; and National Copper and Smelting, Huntsville, AL.

As indicated in the name of the program, this is a partnership between industry and education. The State Department of Education provides teachers, curriculum writers, materials and equipment. But, for every dollar invested by the department of education, Lozier must provide matching funds. Lozier is interested in training their employees and has made a commitment to provide training to help you understand and do your job better.

The curriculum to be used in this training program is designed to be job specific. We welcome any suggestions you have for this program. This program is for you.

THE TRAINING PARTNERSHIP

Tips to Help You Get the Greatest Benefits from Training

Training is a PARTNERSHIP between you and your trainer. This relationship implies responsibilities for both parties.

There are a few activities that will help you get the most from your training experience.

Write It Down

Writing things down in your own words helps you to remember more than if you were just listening. This paraphrasing will also help check your understanding of the material.

The written material can serve as a reference for later; it will help you remember what you need to know.

Writing things down may prevent the trainer from having to repeat information.

Writing things down shows the trainer that you are interested in what is being said.

Ask Questions

Asking questions is one of the most important responsibilities in your training partnership. It will help clarify points for you and others.

Questions help you and your trainer check your level of understanding. They also help the trainer know if the training pace is correct.

When you ask a question, you may be asking something that others are wondering about also.

Contribute

To contribute is different from asking questions. This is an opportunity to share experiences and examples that make the trainer's information clearer and more relative to the everyday world.

Contributing makes you feel that you are a part of the training experience and boosts your self-esteem.

Contributing lets the trainer know you're on track.

PREVIEW

The following is a preview of the units that will be covered in the Lozier Training and Development program. Let's see how much you already know!

Fill in the blanks.

1. Most of the power for lifting should come from the muscles in your ___________.

2. __________ _______ are periodic plant inspections to identify possible safety hazards.

3. The four main product lines of Lozier Scottsboro are: storage shelving, display shelving, wood products, and ________________.

4. A _________ ____________ is a narrow strip of steel marked off in units for measuring.

5. It is critical to check the _____________ ________ before using a precision instrument.

6. Equipment worn by an employee to protect themselves from injury while on the job is called _____________ ______________ __________________.

7. A detailed drawing which provides information as to how the object will look when it is completed is called a ________________.

8. A _________________ is an instrument used to measure or lay out angles on drawings.

9. ______________ and ________________ are two of Lozier Corporation's leading customers.

10. The allowable deviation or change from a standard is called ________________.

11. A customer order that does not meet its scheduled ship date is referred to as _____________.

12. ______________ _____________ is used primarily to merchandise products and is available in an array of colors and sizes.

Read the statements and circle either true or false.

13. Loss of sleep is a factor affecting heat stress. True False

14. A severe weather warning indicates employees should go to the nearest designated shelter. True False

15. Lozier Corporation was incorporated in 1962 and employed approximately 25 people. True False

16. The tolerance for shelf length is 1/32 in. During Betty Ann's quality check , her shelves were off by 2/64 in. These shelves should be rejected. True False

17. You should never place a caliper or micrometer on the top of a running machine. True False

18. Contact lens can be worn on the production floor. True False

19. The title block is always located at the top of blueprints. True False

20. The numerator of a fraction indicates the equal parts into which the unit is divided. True False

21. Salt supplements (salt tablets) are not recommended to prevent heat disorders since too much salt can cause higher body temperature. True False

22. Heat disorders are preventable with proper planning, supervision, and training. True False

23. Only certain people on the floor can effect inventory. True False

24. The recipe for making the items sold by Lozier is called a Bill of Material. True False

25. Inventory transactions are made by the person moving the material. True False

Read the following and circle the best answer.

26. The following are factors preventing back injuries. Circle the letter below that corresponds to the factor that would **not** help in the prevention back injuries.
    (a) tighten your abdomen.
    (b) twist your body when lifting or setting an object down.
    (c) face the object squarely and get as close to it as you can.
    (d) keep your back straight and upright as possible.

27. Listed below are signals an employee would recognize in the event of an emergency. Three of the four signals listed would involve an employee moving to or from a shelter. Circle the letter that corresponds to the signal that does not involve a shelter.
    (a) continuous blast
    (b) all clear
    (c) intermittent blast
    (d) tornado warning

28. Lozier Scottsboro plant was acquired in:
    (a) 1956
    (b) 1968
    (c) 1972
    (d) 1981

29. A denominator:
    (a) indicates the equal number of parts into which the unit is divided
    (b) is a part of a whole quantity
    (c) is a figure or amount obtained by measuring
    (d) is the top number of a fraction

30. The following are all measurement tools. Circle the letter that corresponds to the tool that would be used to measure a 4 ft. piece of shelving.
    (a) caliper
    (b) tape measure
    (c) protractor
    (d) micrometer

31. Hearing protection is required:
    (a) for people who have hearing problems
    (b) when noise in an area bothers you
    (c) only when operating loud machinery
    (d) by all employees working in noisy plant areas

32. The revision number on a blueprint is located:
    (a) in the notes section of a print
    (b) in one location on a print
    (c) in two locations on a print
    (d) in three locations on a print

33. The first step in solving a problem is to:
    (a) look for a solution
    (b) evaluate possible solutions
    (c) find someone to blame
    (d) define the problem

34. A "win-win" situation means:
    (a) there is no solution to the problem
    (b) you flip a coin to see who wins
    (c) a solution is reached that will satisfy both parties involved
    (d) one party agrees to compromise

35. Brainstorming means:
    (a) there is a big problem with communication
    (b) the person doing the speaking becomes confused
    (c) thinking of as many ideas as possible
    (d) all of the above

36. Who is responsible for transactions of inventory?
    (a) supervisors and crew leaders
    (b) supervisors only
    (c) forklift drivers
    (d) everyone

37. The ART system is:
    (a) Automated Rail Transaction
    (b) Art system for designing products
    (c) Automated Real-time Tracking
    (d) only used to load trucks

38. The time in working days needed from receipt of an acceptable order to process, manufacture, and ship is called:
    (a) order take off
    (b) order turn time
    (c) on hand notice
    (d) order lead time

39. An intermittent blast heard throughout the plant means:
    - (a) there is a fire in the building
    - (b) a thunderstorm warning has been issued
    - (c) a tornado warning has been issued
    - (d) you need to evacuate the building

40. A continuous blast means:
    - (a) all is clear
    - (b) a tornado warning has been issued
    - (c) to evacuate the building
    - (d) to wait for further instructions

41. Billy worked $52\frac{1}{2}$ hours last week at Lozier. If he worked 5 days, about how many hours did he work each day?

42. Margaret lives $\frac{3}{8}$ mile from Lozier. How far does she walk in a five-day week, if she walks to work and back home each day?

43. George had a board measuring $38\frac{3}{4}$ inches long. He cut off $\frac{5}{16}$ of an inch so that the board would fit a shelf. How long was the board after being cut?

44. John is installing a window in Nancy's office that is 30 inches wide. He will need an additional $\frac{3}{4}$ inch space on each side for the rough opening. How wide will the opening for the window need to be?

45. $\frac{7}{10} \div 3\frac{1}{2} =$

46. $\frac{5}{8} \div 5 =$

47. $$\begin{array}{r} 12\frac{2}{3} \\ -\ 9\frac{3}{4} \\ \hline \end{array}$$

48. $$\begin{array}{r} 9\frac{3}{5} \\ -\ \frac{1}{6} \\ \hline \end{array}$$

49. $$\begin{array}{r} 4\frac{9}{16} \\ +\ 3\frac{1}{8} \\ \hline \end{array}$$

50. $12\frac{1}{2} \times \frac{2}{5} =$

SAFETY ONE

Personal Protective Equipment

Module: **Personal Protective Equipment and Appropriate Clothing (Safety Level 1)**
Overall Time 60 min.
Page 1 of 1
Job Title: **General/New Hires**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learner should be able to identify Personal protective equipment and distinguish between appropriate and inappropriate means of protection.	**Motivational Activity:**. Divide learners into 2 teams and play a modified version of the game Pictionary.	15 min	Board, marker, timer, and cards telling learner what to draw.	Observation
	Vocabulary: Class will discuss word and give examples.	10 min	Flip Chart	Participation
	Guided Practice: Instructor will lead discussion on the following topics: Hearing Conservation Program, Personal protective equipment, Appropriate Clothing, and General Safety Rules.	15 min	Overhead projector, transparencies, Attachments B,C,D, and E.	Participation
	Independent Practice: Learners will complete true/false questions and crossword puzzle.	15 min	Attachment F and G	Instructor will check for accuracy
	Evaluation: Instructor will review puzzle answers and emphasize the importance of using appropriate and proper means of Personal protective equipment.	5 min	Crossword puzzle and clues	Participation

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SAFETY
ONE

ALTERNATE MOTIVATIONAL ACTIVITY

Brainstorming Session

Using flip chart, list accidents that could occur when not wearing Personal Protective Equipment (PPE) properly.

Ask learners to elaborate on accidents they have had or seen in the workplace. How could these accidents been avoided?

LOZIER CORPORATION

Job Title: General/New Hires

Module: Personal Protective Equipment - Safety Level 1

Specific Instructional Objective: Learner should be able to identify Personal Protective Equipment (PPE) and distinguish between appropriate and inappropriate means of protection. Upon completion of lesson, learner should be able to complete evaluation with 100% accuracy.

Motivational Activity: Have learners divide into two teams and play a modified version of the game Pictionary®. Explain that the purpose of the game is to quickly guess what is being drawn by the team leader. No numbers, words or gestures may be used. The team with the most points wins the game. Each team gets to draw from the following categories: Inappropriate clothing, Appropriate clothing, Proper use of Personal Protective Equipment and Improper use of Personal Protective Equipment. Each team has 2 minutes to guess what the team leader is drawing. The drawing should start simple, with details added as you go. After each drawing, ask participants to read card and allow for discussion. When the game is finished ask the learner if their initial thoughts were correct or if they needed more details to guess correctly. Explain how important details can be when you are talking about safety.

Vocabulary: Class will discuss definitions of vocabulary words. Instructor will ask learners to give examples of some of the words using flip chart to record answers.

Occupational related injury
Personal Protective Equipment
Audiograms
Appropriate Clothing
Tripping Hazard
Noise
Horseplay
OSHA

Guided Practice: Instructor led discussion on the following topics: Hearing Conservation Program, Personal Protective Equipment, Appropriate Clothing, General Safety Rules (Attachments B-E). Overhead provided for reinforcement.

Independent Practice: Learners will complete True or False assessment (Attachment F). Learners will complete crossword puzzle using clues provided.

Evaluation: Instructor will check answers to True/False questions and review puzzle answers. Instructor will emphasize the importance of using appropriate and proper means of Personal Protective Equipment.

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Attachment A
Transparency

VOCABULARY

Appropriate Clothing -

Audiograms -

Horseplay -

Noise -

Occupational related injury -

OSHA -

Personal Protective Equipment -

Tripping Hazard -

Attachment A

VOCABULARY

Appropriate Clothing - Clothing, shoes, etc. that meet company standards in regard to policy.

Audiograms - Record produced by a device used for recording the measurement of hearing.

Horseplay - Nonsense activity on the job.

Noise - A sound of any kind.

Occupational related injury - An injury sustained while working on the job.

OSHA - Occupational Safety and Health Administration - Agency that provides rules governing the workplace to insure the safety of the employee.

Personal Protective Equipment - Equipment worn by an employee to protect themselves from injury while on the job.

Tripping Hazard - Obstacle that may cause one to trip or stumble.

Attachment B

Lozier Safety & Health Policy

We at Lozier believe it is in the best interest of our employees to pursue a safe and healthy work environment. At the same time, we want to provide stable and rewarding employment for members of our community.

Our goal is continuous improvement toward the prevention of occupationally related injuries and illnesses. To that end our efforts will include:

1. Operating and maintaining facilities in conformance to state and federal safety and health guidelines.
2. Investigating and employing improved manufacturing processes and safety policies that will enable us to further reduce the potential of occupational injury and illness.
3. Conducting safety and health inspections to detect and eliminate unsafe working conditions or practices.
4. Prompt and thorough investigations of every accident to determine its cause and correct the condition to prevent a reoccurrence.
5. Training for all employees in good safety and health practices.

To be successful, our program requires cooperation in all safety and health matters and the proper attitude toward injury and illness prevention on the part of each and every Lozier employee. Only through such a cooperative effort can a safety program in the best interest of all be established and maintained.

Source: Lozier Corporation, Safety Guidelines. 18765 Rev. 7/93

Personal Protective Equipment Guidelines

The purpose of the Personal Protective Equipment (PPE) program is to ensure the safety of all Lozier employees while engaged in activities that have the chance of causing injury. This policy has been developed to address the personal safety of each Lozier employee and specifically applies to the use and maintenance of PPE for Lozier employees.

Personal Protective Equipment (welding hoods, hard hats, eye protection devices, ear plugs, arm guards, gloves, aprons, etc.) is required for certain jobs throughout the plant. Your supervisor will explain what equipment is required for the job you will be performing. Wear the equipment properly and report any defective equipment to your supervisor.

EYE AND FACE PROTECTION

All employees will wear approved eye protection with side protection when exposed to flying particles or potentially injurious light radiation. Employees wearing prescription glasses must have eyewear with the approved protection factor or they **must** wear approved eye protection over the prescription glasses.

Contact lenses should **not** be worn on the production floor. Heat in the work environment can melt the contact to the eye causing permanent eye damage.

HEAD PROTECTION

All employees will wear protective helmets when working in areas where the potential for injury from falling objects could occur.

FOOT PROTECTION

All employees will wear protective footwear when there is a danger of foot injuries due to falling and rolling objects, objects piercing the sole, or electrical hazards.

HAND PROTECTION

All employees will wear hand protection when exposed to but not limited to: materials or objects that may cause severe cuts, lacerations, or abrasions and chemicals that have the possibility of absorbing through the skin.

Source: Lozier Safety Procedures

Hearing Conservation Program

Too much noise will damage hearing. The problem with hearing loss is that it occurs slowly. The only way to prevent hearing loss is to keep noise levels down or to wear hearing protection whenever working around noisy equipment.

The hearing conservation program applies to all employees who have duties that require them to work in noisy areas. It also applies to any contractors who have to work in noisy areas on the premises.

SUPERVISORS RESPONSIBILITIES:

- Make sure employees are properly trained.
- Ensure that employees properly wear hearing protection.

EMPLOYEE RESPONSIBILITIES:

- Wear hearing protection where required.
- Clean and maintain hearing protection.
- Report any areas which they feel are noisy and need to be monitored.

Source: Lozier Safety Procedures

Appropriate Clothing

Appropriate clothing for employees must be worn when working in manufacturing areas:

Shirt:

- Long or short sleeves
- No sleeveless shirts or tank tops
- Shirt tails must be kept tucked into the slacks or trousers

Slacks or trousers:

- No skirts, dresses or shorts
- Slacks or trousers should be of denim-like material
- No sweat pants allowed due to flammability and loose fit

Shoes or boots:

Shoes or boots made of durable leather material must be worn at all times when in the plant. Canvas, nylon, plastic, and open-toed shoes offer little or no protection and are not allowed. Steel-toed safety shoes offer the best protection and are highly recommended.

Socks must be worn at all times.

General Safety Rules

A. Do not operate vehicles, machinery or equipment unless you have been properly trained and specifically authorized to do so.
Example: Do not operate a forklift unless you have a license to operate a forklift.

B. Never use defective tools or equipment. Always make a brief check to be sure they are in proper condition and report any defects to your supervisor.

C. Never operate tools, machinery or equipment without properly adjusted guards.

D. Keep your work area neat and orderly. A sloppy work area is unsafe and leads to sloppy work habits.

E. Never walk under a suspended load.
Example: Forklift.

F. Never use compressed air or other gases to blow dust off your skin or clothing.

G. Horseplay has no place in an industrial environment and will not be tolerated.

H. When walking through the parking lots or plant areas remain alert for moving vehicles. Never assume that the operator can see you.

I. Report any unsafe condition to your supervisor.

J. Never block or obstruct fire fighting or emergency equipment or exits.

K. Stay alert when walking through plant areas. Watch for and correct tripping hazards - even small items such as paper clips, paper, pencils, nails, fittings, etc., can cause big accidents.

L. If you spill something, clean it up. Don't leave it for someone else to slip on. Contact supervisor for proper cleaning procedure of a spill.

Attachment F

TRUE OR FALSE?

DIRECTIONS: Read each statement below then circle the correct answer.

1. True False Contact lens can be worn on the production floor.

2. True False If you wear prescription glasses, you do not need to wear approved eye protection over the prescription glasses.

3. True False Protective helmet must be worn in work areas where the potential for injury from falling objects could occur.

4. True False Forklift drivers always have the right of way.

5. True False The only way to prevent hearing loss is to keep noise level down.

6. True False Socks are required to be worn only in cold weather.

7. True False Appropriate clothing must be worn at all times in the plant areas.

8. True False Steel-toed safety shoes offer the best protection.

9. True False Canvas tennis shoes are allowed in some areas of the plant.

10. True False In extremely hot weather, tank tops are allowed to be worn in the plant.

11. True False To be successful, the safety program requires the cooperation of every Lozier employee.

12. True False When walking in plant aisles, you should walk on the right side.

Attachment F
Answer Sheet

TRUE OR FALSE?

DIRECTIONS: Read each statement below then circle the correct answer.

1. True [✓ False] Contact lens can be worn on the production floor.

2. True [✓ False] If you wear prescription glasses, you do not need to wear approved eye protection over the prescription glasses.

3. [✓ True] False Protective helmet must be worn in work areas where the potential for injury from falling objects could occur.

4. True [✓ False] Forklift drivers always have the right of way.

5. True [✓ False] The only way to prevent hearing loss is to keep noise level down.

6. True [✓ False] Socks are required to be worn only in cold weather.

7. [✓ True] False Appropriate clothing must be worn at all times in the plant areas.

8. [✓ True] False Steel-toed safety shoes offer the best protection.

9. True [✓ False] Canvas tennis shoes are allowed in some areas of the plant.

10. True [✓ False] In extremely hot weather, tank tops are allowed to be worn in the plant.

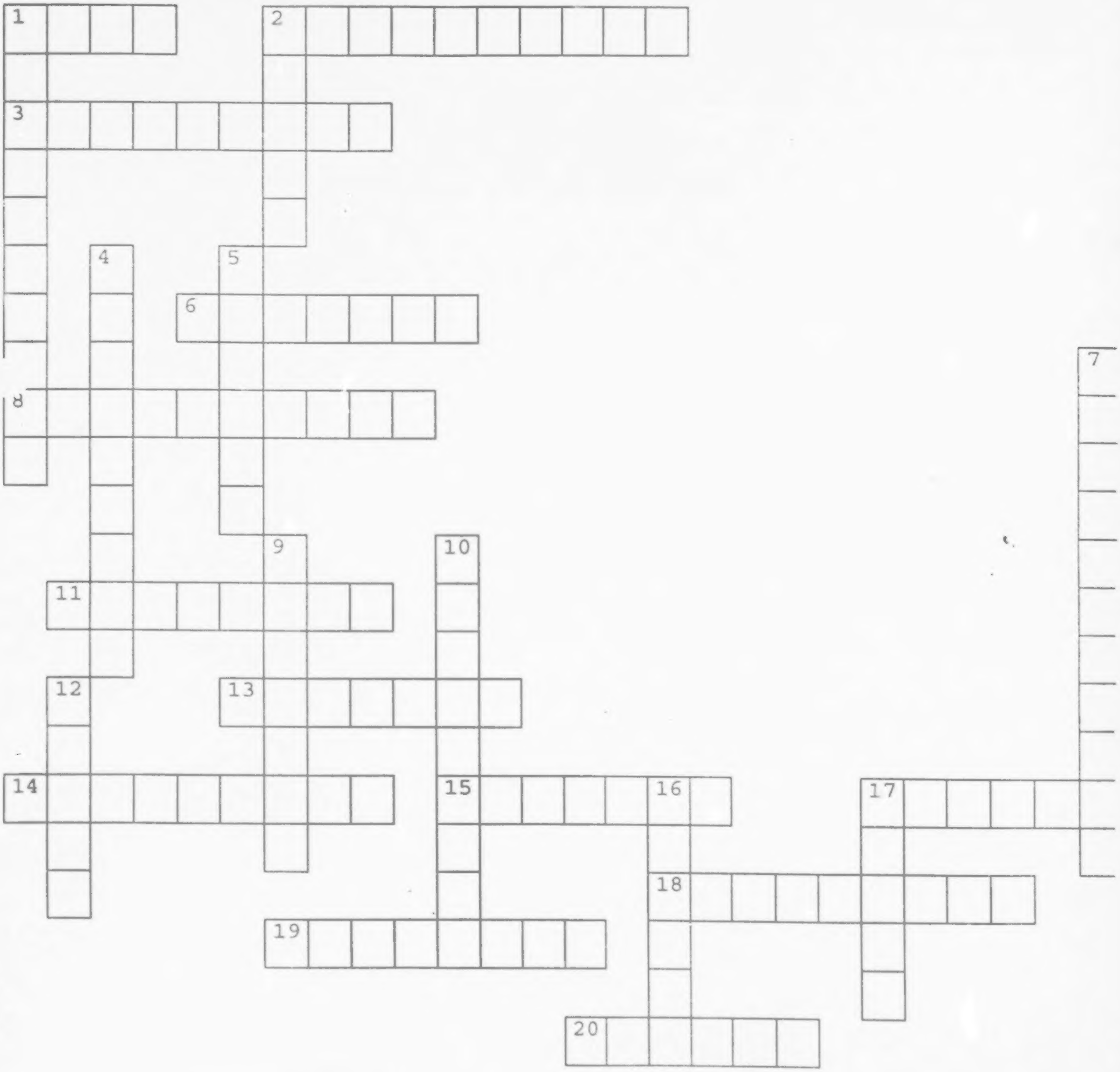
11. [✓ True] False To be successful, the safety program requires the cooperation of every Lozier employee.

12. [✓ True] False When walking in plant aisles, you should walk on the right side.

Attachment G

Safety Level 1
Crossword Puzzle

Use the clues provided to work the crossword puzzle.



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ACROSS

1. Do not leave anything laying around for someone to ______ on.
2. Never use _______ air or other gases to blow dust off your skin or clothing.
3. Do not operate vehicles, machinery or _______ unless you are properly trained and specifically authorized to do so.
6. Stay alert when ________ through plant areas.
8. Report any unsafe condition to your _________.
11. Personal Protective Equipment is ___________ for certain jobs.
13. Shoes or boots made of durable ________ materials must be worn at all times when in the plant.
14. ________ has no place in the industrial environment and will not be tolerated.
15. Stay alert when walking _______ plant areas.
17. Never ______ the operator of a moving vehicle can see you.
18. Watch for and correct tripping hazards that can cause big _________.
19. Wear the equipment _______ and report any defective equipment to your supervisor.
20. A sloppy work area is ______ and leads to sloppy work habits.

DOWN

1. No _________ shirts or tank tops will be allowed.
2. If you spill something, _______ it up.
4. Never walk under a ________ load
5. Sandals, open-toed shoes or shoe made of ______, nylon or plastic will not be allowed.
7. Steel-toed safety shoes offer th best protection and are highly ___________.
9. Keep your work area neat and ________.
10. Never use _________ tools or equipment, but report them to your supervisor.
12. Never _____ or obstruct fire fighting or emergency equipment exists.
16. Never operate tools, machinery o equipment without properly adjusted _______.
17. When walking through the parking lots or plant areas remain _____ for moving vehicles.

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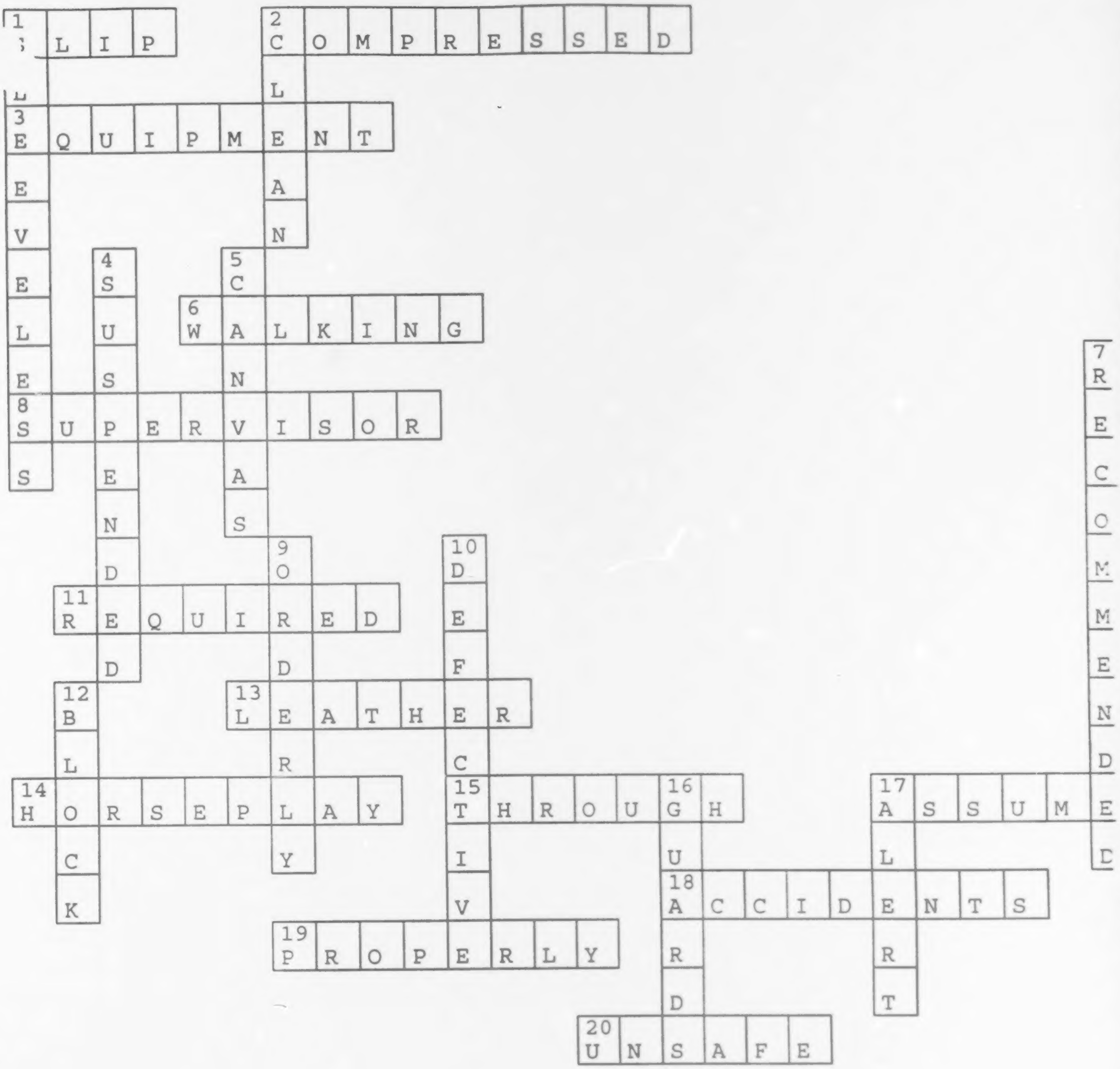

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SAFETY TWO

Heat Stress
and
Back Injuries

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Module: **Preventing Heat Stress and Back Injuries (Safety 2)** **Overall Time 60 min.**
Page 1
Job Title: General/New Hires

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learner should be able to identify ways to prevent heat stress and back injuries and complete evaluation with 100% accuracy.	**Motivational Activity:** On overhead slide, show statistics on back injuries. Ask for class participation and list on a flip chart, accidents that have occurred and discuss how these injuries have effected his/her lifestyle. Relate home and work activities.	5 min	Overhead projector and transparency	Participation
	Vocabulary: Distribute cards with definitions. Words printed on cards will be posted on the wall. Learners with card with matching definition will place his/her card under the word.	10 min	Cards with words and definitions. Attachment A	Participation
	Guided Practice: Teacher will lead discussion on Heat Stress and Back injury. Show video on proper lifting techniques.	25 min	Attachments B, C, and D VCR, Video	Participation
	Independent Practice: Learners will complete worksheets (Attachments E and F).	10 min	Attachments E and F	Instructor will check worksheets for mastery.
	Closure: Discussion of worksheet answers.	5 min		Participation

LOZIER CORPORATION

Job Title: General/New Hires

Module: Prevention of Heat Stress and Back Injuries - (Safety 2)

Specific Instructional Objective: Learner should be able to identify ways to prevent heat stress, and back injury. Learner should be able to complete evaluation with 100% accuracy.

Motivational Activity: On overhead slide, show statistics on back injuries. Ask for class participation and list on a flip chart, accidents that have occurred and discuss how these injuries have effected his/her lifestyle. Relate home and work activities.

Vocabulary: Words and definitions will be printed on colored paper and laminated. Words will be displayed on the wall, definitions will be passed out to the learners. Learners will have to match their definition with the correct word on the wall. Glossary is provided in learners' materials (Attachment A).

Guided Practice: Instructor will lead discussion on Heat Stress and Back Injuries using overheads provided and Attachments B, C, and D. Show video of proper lifting techniques. (Video will be made of employees on the paint lines using proper lifting procedures.)

Independent Practice: Learners will complete worksheets (Attachments E and F).

Closure/Evaluation: Instructor will check worksheets for mastery.

Attachment A

VOCABULARY

Acclimatization - The process of adapting to a new environment.

Fatigue - Weariness from labor or exertion.

Dehydration - An abnormal depletion of body fluids.

Evaporation - Results of moisture being withdrawn leaving a dry surface

Heat Cramps - Painful (sometimes severe) cramps of the muscles used while working, such as the arms, legs or stomach. They often don't occur until later when relaxing after work.

Heat Exhaustion - A condition caused by over exposure to heat (a more severe condition than heat cramps).

Heat Stroke - The state of exhaustion and collapse caused by prolonged exposure to heat. Heat stroke develops when the body systems are overwhelmed by heat and begin to stop functioning.

Attachment B
Page 1 of 4

Three Major Heat Disorders

Heat Cramps

Heat Exhaustion

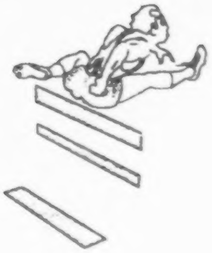
Heat Stroke

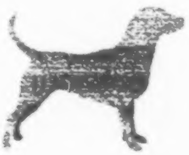
Of the three, heat stroke is the most sever. It is a medical emergency requiring immediate attention. The state of exhaustion and collapse caused by prolonged exposure to heat. Heat stroke develops when the body systems are overwhelmed by heat and begin to stop functioning.

Who is at Risk?

Everyone! Heat stress is not limited to people who are elderly, in poor health, or not as strong physically as others. Everyone is at risk, especially those who live in warm climates or who work in warm temperatures. Some examples of those who are often at risk are:

Farmers
Restaurant workers (in hot kitchens)
Construction workers
Military personnel
Factory workers
Athletes
Animals





Heat disorders are preventable with proper planning, supervision and training.

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Factors Affecting Heat Stress

Physical conditions that can hurt your body's natural ability to withstand high temperatures include:

- Dehydration (water loss)
- Diarrhea
- Exposure to high temperatures
- Fatigue
- Lack of acclimatization
- Loss of sleep
- Medications such as antihistamines, cold medicines, diuretics and some tranquilizers
- Recent immunizations
- Recent alcohol use - within 24 hours
- Wrong type clothing - tight clothing restricts circulation and keeps air from flowing over the skin

CONTROLLING HEAT STRESS

High temperatures put stress on our bodies. When the body's cooling system has to work too hard to reduce heat stress, it can strain itself. This physical strain - combined with other stresses such as work, loss of fluids, or fatigue - may lead to heat related illness. Your body always generates internal heat, but the amount of heat that stays stored in your body is effected by several factors. Some of these factors are:

- Surroundings
- Level of physical activity
- Type of work
- Time spent working
- Recovery time between work periods

You owe it to yourself and your fellow workers to recognize the signs of heat stress and know the proper first aid measures. You can take precautions to prevent heat stress in the following ways:

- Acclimatization
- Proper work procedures
- Appropriate food and ample water intake

Become Adapted to your Environment

If you can't control the temperature or humidity in your workplace, you must become acclimatized to it. Acclimatization is the ability to perform maximum amounts of strenuous work in the heat by gradually getting yourself accustomed to the climate you work in. Some workers reach full acclimatization within a week, while others take longer. If you go on vacation, remember that you will start losing your resistance to heat after one week, and you'll lose it completely in a month.

Follow proper Work Procedures

An important method for reducing the ill effects of heat stress is to follow scheduled work/rest cycles that keep an individual from overdoing. Sometimes it is possible for workers to alternate light and heavy work, indoor and outdoor work, etc.

Proper Food and Water Intake is Important

Most people don't realize that hot foods add directly to body heat. Heavy meals reduce your ability to get rid of heat because they redirect blood flow to your digestive track instead of your skin surface. Be sure your noon meal is light and cool. Plan on eating your heaviest meal of the day after the workday is over.

The most important step you can take to avoid heat disorders is to replenish water and salt used up by your body's cooling mechanisms. Fluid intake should equal fluid loss throughout the day. Drink 5 to 7 ounces of water every 15 to 20 minutes, even if you don't feel thirsty.

Except when treating heat disorders, ***salt supplements are not recommended***, since too much salt can cause higher body temperature, increased thirst and nausea. The normal diet usually has enough salt in it, but if you sweat continuously or repeatedly, you may use extra salt at the table. Salt tablets are considered harmful because the salt doesn't enter your system as fast as water or other fluids.

SAFETY GUIDELINES TO PREVENT BACK INJURIES

- Face the object squarely and get as close to it as you can.
- Balance yourself solidly, with your feet slightly apart.
- Squat down, bending your knees.
- Keep your back as straight and upright as possible.
- Grip the object firmly.
- Tighten your abdomen.
- Use your legs to bring you to a standing position, keeping your back straight.
- Perform the lifting technique smoothly and under control.
- Don't lift object over your head.
- Don't twist your body when lifting or setting an object down.
- Pace yourself to avoid fatigue.
- Don't reach over something to lift a load.

Attachment D

LET'S SEE WHAT YOU REMEMBER!

Directions: Read each statement and write your answer in the space provided:

1. List four factors affecting heat stress.

2. List three ways you can help to control heat stress.

3. List the five proper lifting techniques that will help prevent back injuries.

4. List something that you do at work that requires using proper lifting.

5. List one thing you do at home that should involve proper lifting procedures.

Attachment E

TRUE OR FALSE?

DIRECTIONS: Read each statement below then circle the correct answer.

1. True False The muscles of the abdomen help support the back.
2. True False Loss of sleep is not a factor affecting heat stress.
3. True False Keep your back as straight as possible when lifting.
4. True False For a safe lift, the load should be held as close to you as possible.
5. True False Heat disorders are not preventable.
6. True False Most of the power for lifting should come from your leg muscles.
7. True False To avoid back injury when lifting, make the lift smoothly and under control.
8. True False Salt tablets are not recommended except in treating certain conditions.
9. True False Heat stroke is the most servere heat disorder.
10. True False Hot meals do not add to body heat.

Attachment E

Answer Sheet

TRUE OR FALSE?

DIRECTIONS: Read each statement below then circle the correct answer.

1. [✓ True] False The muscles of the abdomen help support the back.
2. True [✓ False] Loss of sleep is not a factor affecting heat stress.
3. [✓ True] False Keep your back as straight as possible when lifting.
4. [✓ True] False For a safe lift, the load should be held as close to you as possible.
5. True [✓ False] Heat disorders are not preventable.
6. [✓ True] False Most of the power for lifting should come from your leg muscles.
7. [✓ True] False To avoid back injury when lifting, make the lift smoothly and under control.
8. [✓ True] False Salt tablets are not recommended except in treating certain conditions.
9. [✓ True] False Heat stroke is the most severe heat disorder.
10. True [✓ False] Hot meals do not add to body heat.

SAFETY THREE

Evacuation
and
Housekeeping

Module: **Evacuation & Housekeeping (Safety 3)** **Overall Time 60 min.**
Page 1
Job Title: **General/New Hires**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners will identify emergency response evacuation procedures and be able to list three possible hazards that could hinder their ability to respond to emergencies with 100% accuracy..	**Motivational Activity:**. Housekeeping video and discussion on ways housekeeping could effect evacuation procedures and accidents.	5 min	VCR and video	Participation
	Vocabulary: Use overhead transparency to define key words.	10 min	Overhead projector, transparency (Attachment A)	Participation
	Instructional Activities: Teacher will lead discussion on emergency evacuation procedures and proper housekeeping.	10 min	Lozier Safety procedures (Attachments B, C, and D)	
	Guided Practice: Assist learners in locating designated areas on blueprint.	10 min	Blueprints of designated areas.	Participation
	Independent Practice: Learners will complete assignments independently.	20 min	Attachments E, F, and G	Instructor will check worksheets for mastery.
	Closure: Discussion of worksheet answers.	5 min		Participation

LOZIER CORPORATION

Job Title: New Hires/General Packaging

Module: Evacuation/Housekeeping - Safety 3

General Instructional Objective: To familiarize learners with safety evacuation and housekeeping procedures.

Specific Instructional Objective: Learners will identify emergency response procedures and be able to list, with 100% accuracy, three possible hazards that could hinder their ability to respond to emergencies.

Motivational Activity: Show housekeeping video and lead discussion on ways housekeeping could effect evacuation procedures and effect accidents.

Vocabulary: Use overhead transparency to discuss key words (Attachment A). A glossary is provided in learners' material and may be used as a reference.

Instructional Activities: Teacher will lead discussion on emergency evacuation procedures for both fire/non-weather related emergencies and tornado/weather related emergencies (Lozier safety procedures will be provided). Teacher will also lead discussion on proper housekeeping procedures.

Guided Practice: Using the blueprints for fire and severe weather designated areas, teacher will assist learners in finding the designated area to which he/she should report in case of an emergency.

Independent Practice: Learners will read scenarios and write answers in the space provided (Attachment E). Learners will complete safety worksheet and crossword puzzle (Attachments F and G).

Closure/Evaluation: Teacher will review answers on worksheet and puzzle.

Attachment A
Transparency

Key Words

All clear

Continuous blast

Emergency coordinator

Hazards

Hazard hunt

Intermittent blast

Severe Weather Warning

Tornado Warning

Tornado Watch

Utilities personnel

Attachment A

KEY WORDS

All clear -- Signal given by weather radio or the Emergency Coordinator that the building or area has been cleared.

Continuous blast -- An alarm advising all employees to evacuate the building.

Emergency coordinator -- Person responsible for implementing proper evacuation procedures for Lozier employees.

Hazard -- Risk or danger.

Hazard hunt -- Periodic inspections to identify possible hazards.

Intermittent blast -- An alarm advising all employees that a Tornado Warning has been issued and to report to their designated area.

Severe Weather Warning -- Local weather activity.

Tornado Warning -- Confirmed sighting of a tornado in the local area.

Tornado Watch -- Weather conditions are favorable for a tornado.

Utilities personnel -- Person who will shut down all necessary main power and/or gas supplies prior to going to their designated shelter.

Lozier, Scottsboro -- Tornado Alert Plan

Purpose: The purpose of this procedure is to provide for the safe and efficient evacuation of personnel to the designated safe zones within the building.

Definitions:
Severe Weather Warning -- local thunderstorm activity
Tornado Watch -- weather conditions are favorable for a tornado
Tornado Warning -- confirmed sighting of a tornado in the local area.

Procedure:

1. Severe Weather Warning -- The Emergency Coordinator at each facility will assign one person to monitor the weather via digital radio scanner for weather announcements.
NOTE: All weather radio batteries must be replaced twice a year.

2. Tornado Watch - The Emergency Coordinator will notify all supervisors of the tornado watch. These individuals should be informed to remain alert for a tornado warning.

3. Tornado Warning - The Emergency Coordinator will sound the tornado alarm **(intermittent blast)** or announce over the intercom system advising employees to take cover. Upon hearing this warning, all employees are to proceed in a quick and orderly fashion directly to the designated shelter. Utilities personnel will shut down all necessary main power supplies (gas, water, etc.) prior to going to their designated shelter.

The designated shelters are as follows:

Front office area
Front breakroom
Shipping breakroom
Woodshop breakroom

All employees must remain in the designated shelter area until the "All Clear" is given by the weather radio or the Emergency Coordinator.

4. Once the "All Clear" has been issued, the following will take place, if needed:
    - First aid will be administered to the injured and any needed outside help will be called.
    - The Safety Inspectors and Maintenance personnel will check for electrical hazards, leaking gas and water, and any evidence of fire.
    - The Emergency Coordinator will notify the appropriate personnel of the emergency.
    - All Hazards will be corrected and clean-up begun.

Lozier, Scottsboro - Fire Evacuation Plan

Purpose: The purpose of this procedure is to provide for the safe and efficient evacuation of the building in the event of a fire.

Procedure: 1. In the event a fire is detected beyond the incipient (beginning) stage and cannot be easily extinguishable with a fire extinguisher, the employee discovering the fire shall:

Immediately notify their immediate supervisor.

2. The notified supervisor shall sound the evacuation alarm (**continuous blast**), or page, using the intercom system indicating to all employees to evacuate the building by way of the nearest fire exit (see evacuation plan diagram).

If possible, the notified supervisor will then immediately dial 9-911 and provide the following information:

Nature of emergency
Location: Lozier Corporation
Address: 401 Taylor Street
Name

If it is not possible for the supervisor to dial 9-911 from within the plant (due to heavy smoke, high heat, etc.), the supervisor will evacuate the building with his/her department, assign the duty of conducting a head count to the Lead Person, and call 911 from the nearest outside phone.

3. The notified supervisor shall exit the building and go to the predetermined meeting spot and conduct a head count of his/her employees and administer first aid if needed. No employees will re-enter the building to look for missing personnel. A list of missing employee names and the area they were last seen will be given to the Emergency Coordinator. The Emergency Coordinator will give any lists to the fire or police departments.

4. After the evacuation is complete, the Emergency Coordinator will notify the appropriate personnel of the emergency.

Lozier, Scottsboro - Non-Weather Related Emergency Evacuation Plan (with exception of chemical spill)

Purpose: The purpose of this procedure is to provide for the safe and efficient evacuation of the building in the event of a non-weather related emergency.

Procedure: 1. In the event of a non-weather related emergency (i.e., bomb threat, gas leak, etc.), the employee discovering the emergency shall immediately report the condition to their supervisor who will in turn report the situation to the Plant Manager.

2. The Plant Manager, upon making the decision to evacuate the plant, will sound the evacuation alarm (**continuous blast**), or page, using the intercom system indicating to all employees to evacuate the building by way of the nearest fire exit (see attached map). The following statement is an example of the page that should be utilized to initiate the evacuation.

"Evacuate the plant immediately. This is an emergency evacuation. Quickly, but calmly, proceed to the nearest fire door and move to your predetermined meeting area."

3. Immediately following the page, the Plant Manager will evacuate the building and call **911** from an outside location to notify the fire or police departments.

4. The supervisor shall direct the orderly evacuation of their personnel and shut down operating equipment in their area.

5. Once outside, all employees shall move to their predetermined meeting area and wait for further instruction from their supervisor.

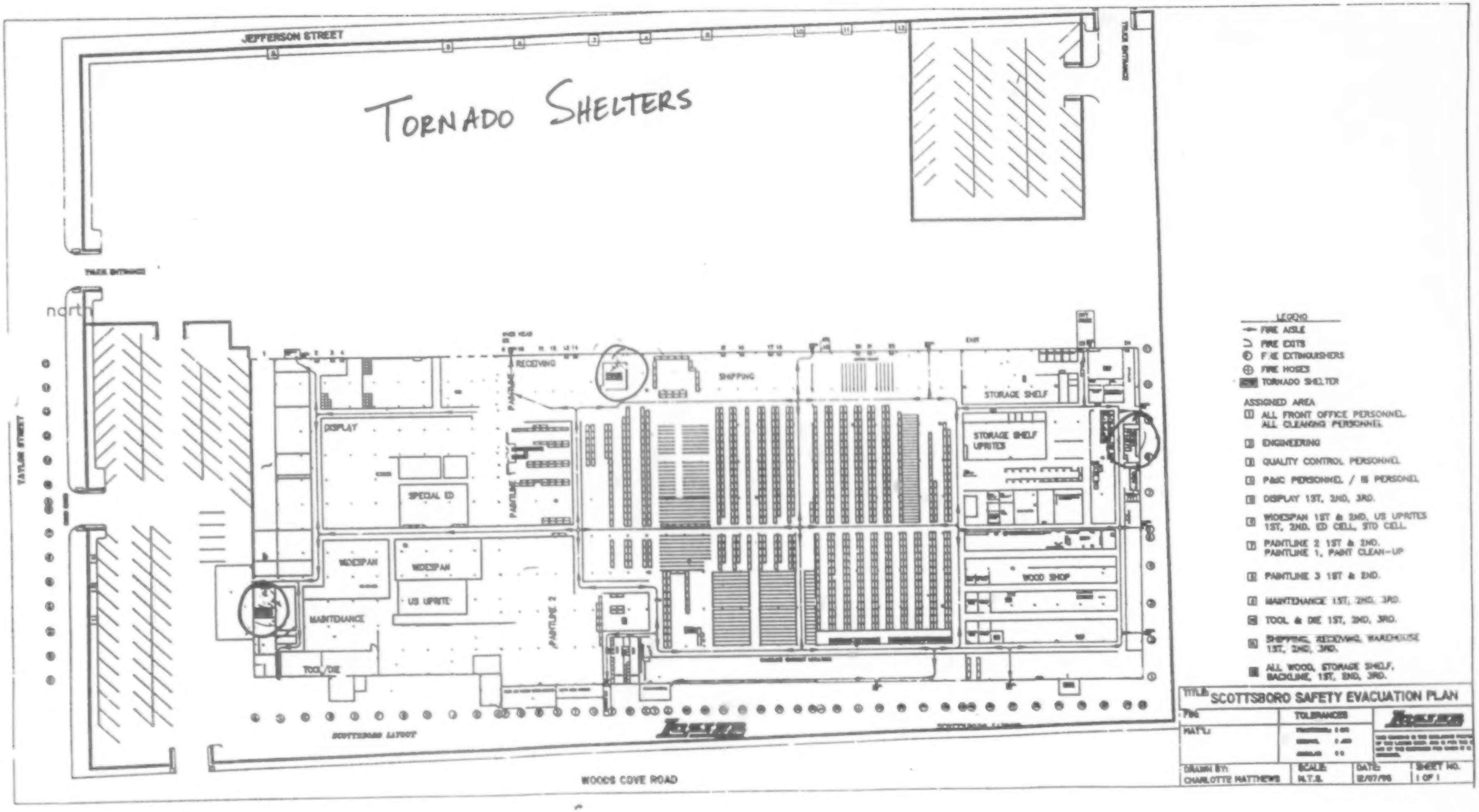
6. Supervisors shall conduct a head count of their employees and administer first aid if needed. No employees will re-enter the building to look for missing personnel. A list of missing employees names and the area they were last seen will be given to the Emergency Coordinator. The Emergency Coordinator will give any list to the fire or police departments.

7. After the evacuation is complete, the Emergency Coordinator will notify the appropriate personnel of the emergency.

8. No employees may re-enter the building without first receiving an "All Clear" signal from the Plant Manager.

Emergency Organization

Lozier Corporation has an emergency organization responsible for designated responsibilities in the event of an emergency. Utility personnel from each shift are included in this organization. These responsibilities include notifying emergency authorities, directing traffic in and out of the building, and conducting procedures for shutting down utilities.



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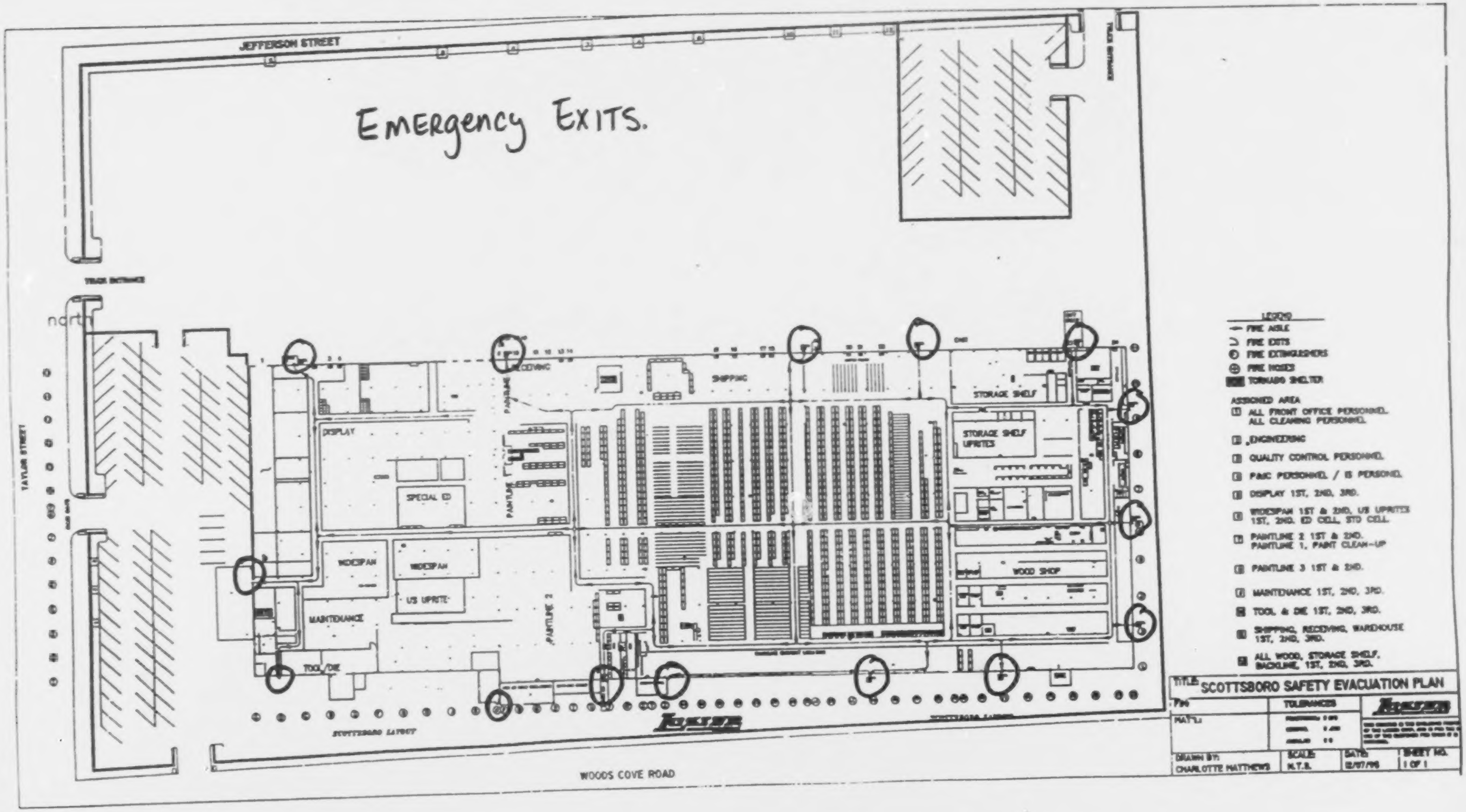

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SCOTTSBORO LAYOUT
WOODS COVE ROAD
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FIRE EXTINGUISHERS
FIRE HOSES
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WIDESPAN 1ST & 2ND, US UPRITES 1ST, 2ND. ED CELL, STD CELL.
PAINTLINE 2 1ST & 2ND. PAINTLINE 1, PAINT CLEAN-UP
PAINTLINE 3 1ST & 2ND.
MAINTENANCE 1ST, 2ND, 3RD.
TOOL & DIE 1ST, 2ND, 3RD.
SHIPPING, RECEIVING, WAREHOUSE 1ST, 2ND, 3RD.
ALL WOOD, STORAGE SHELF, BACKLINE, 1ST, 2ND, 3RD.
TITLE: SCOTTSBORO SAFETY EVACUATION PLAN
TOLERANCES
MAT'L:
DRAWN BY: CHARLOTTE MATTHEWS
SCALE: N.T.S.
DATE: 12/07/98
SHEET NO. 1 OF 1

Emergency Exits.

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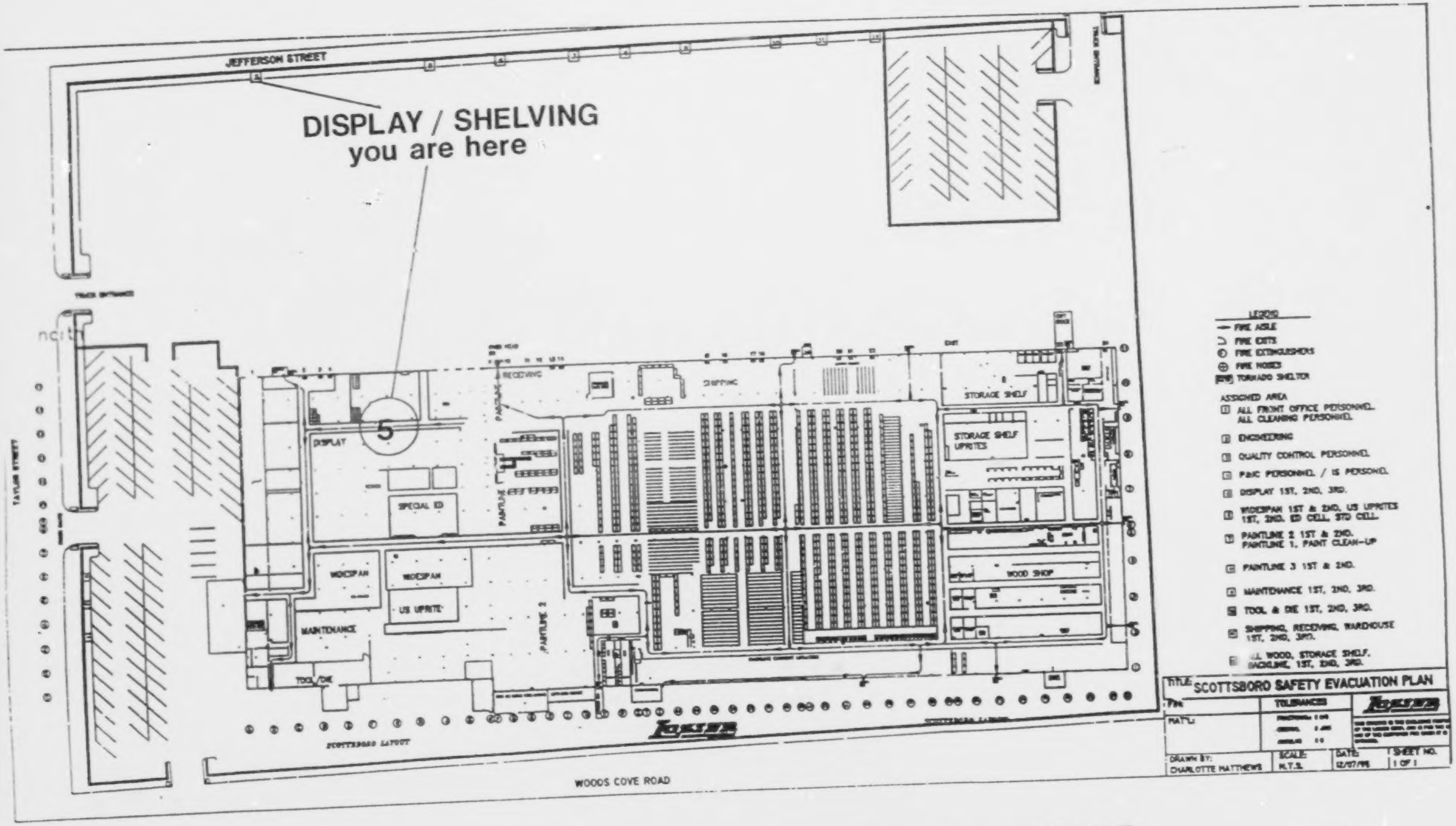

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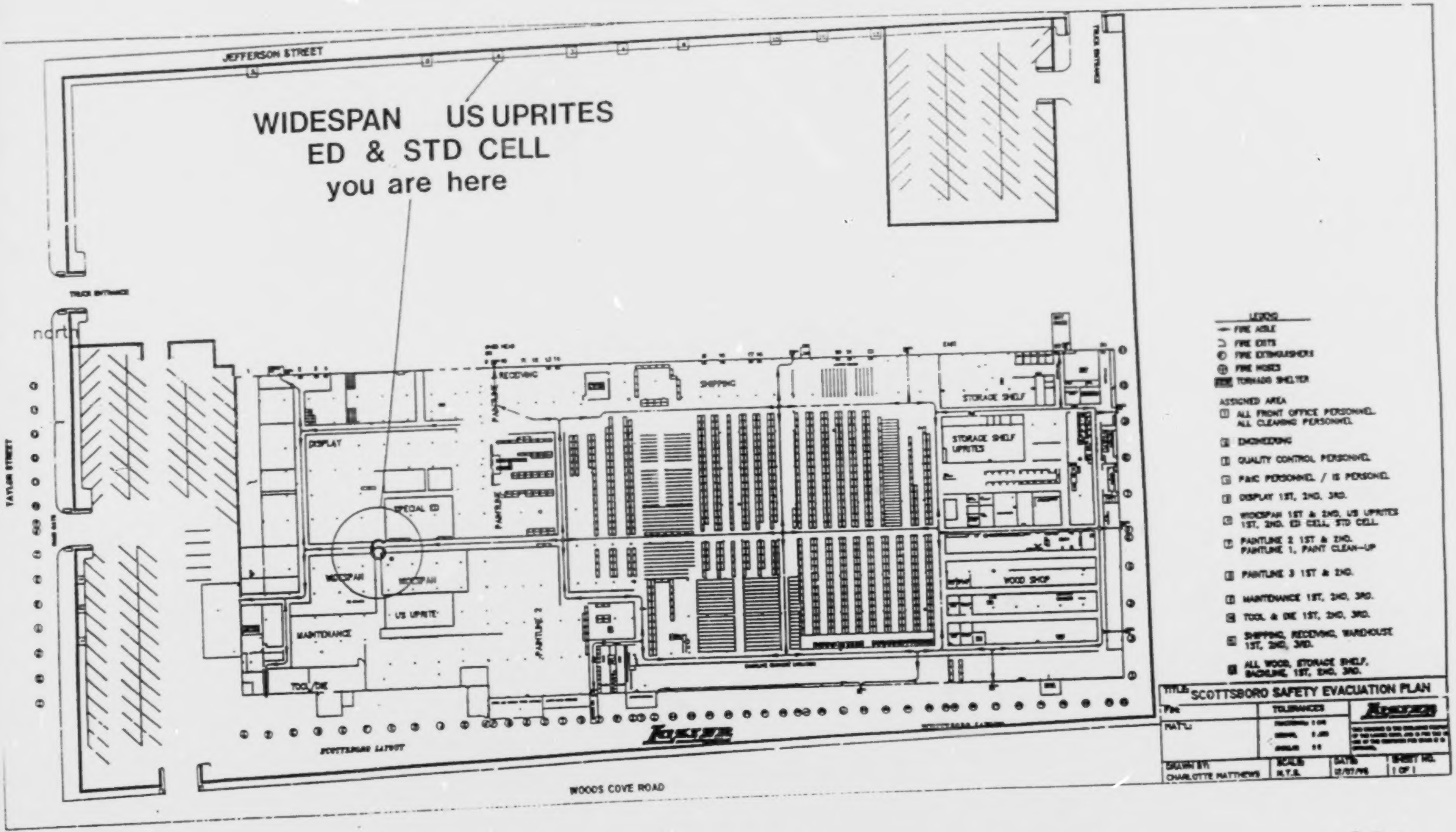

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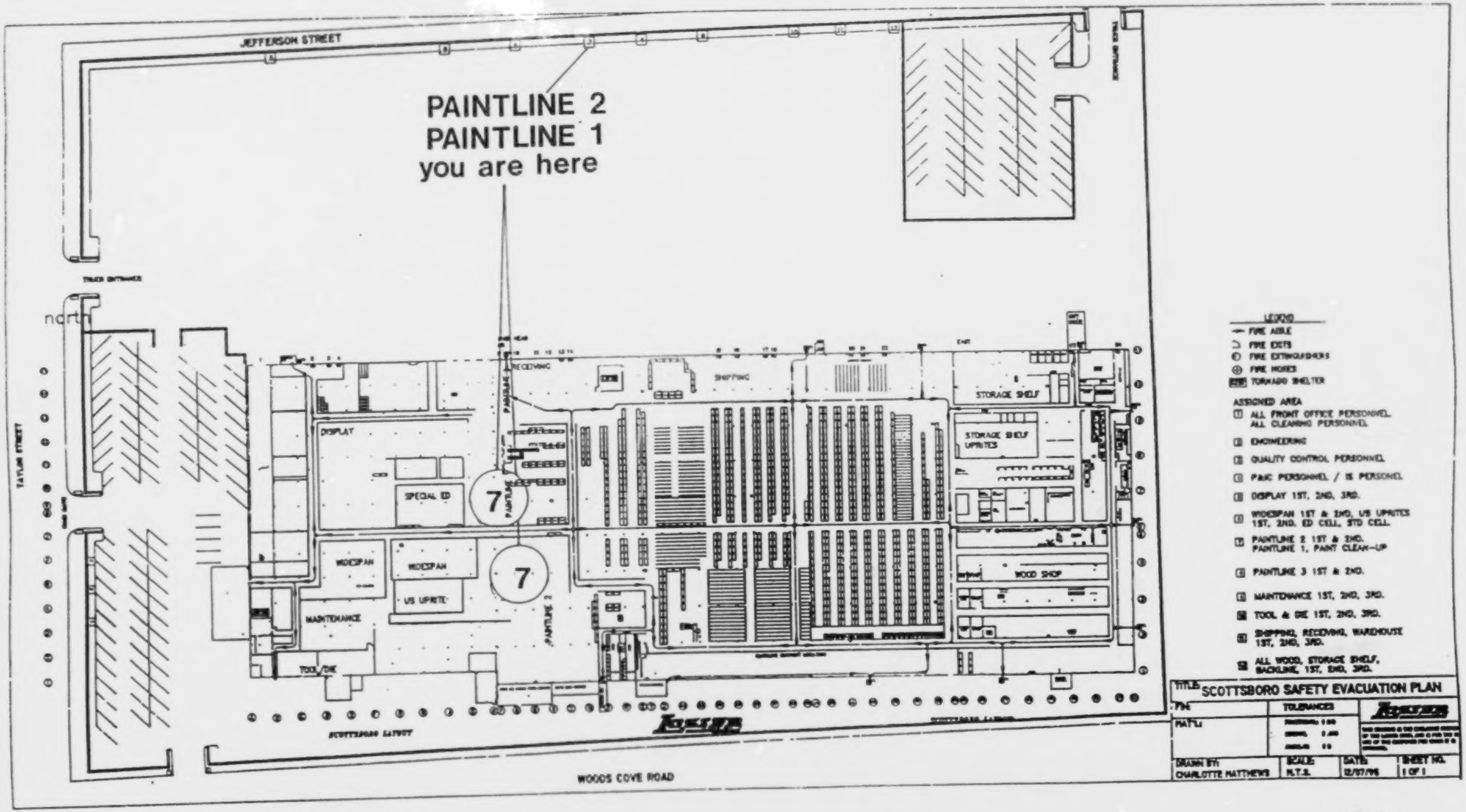
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SCALE: N.T.S.
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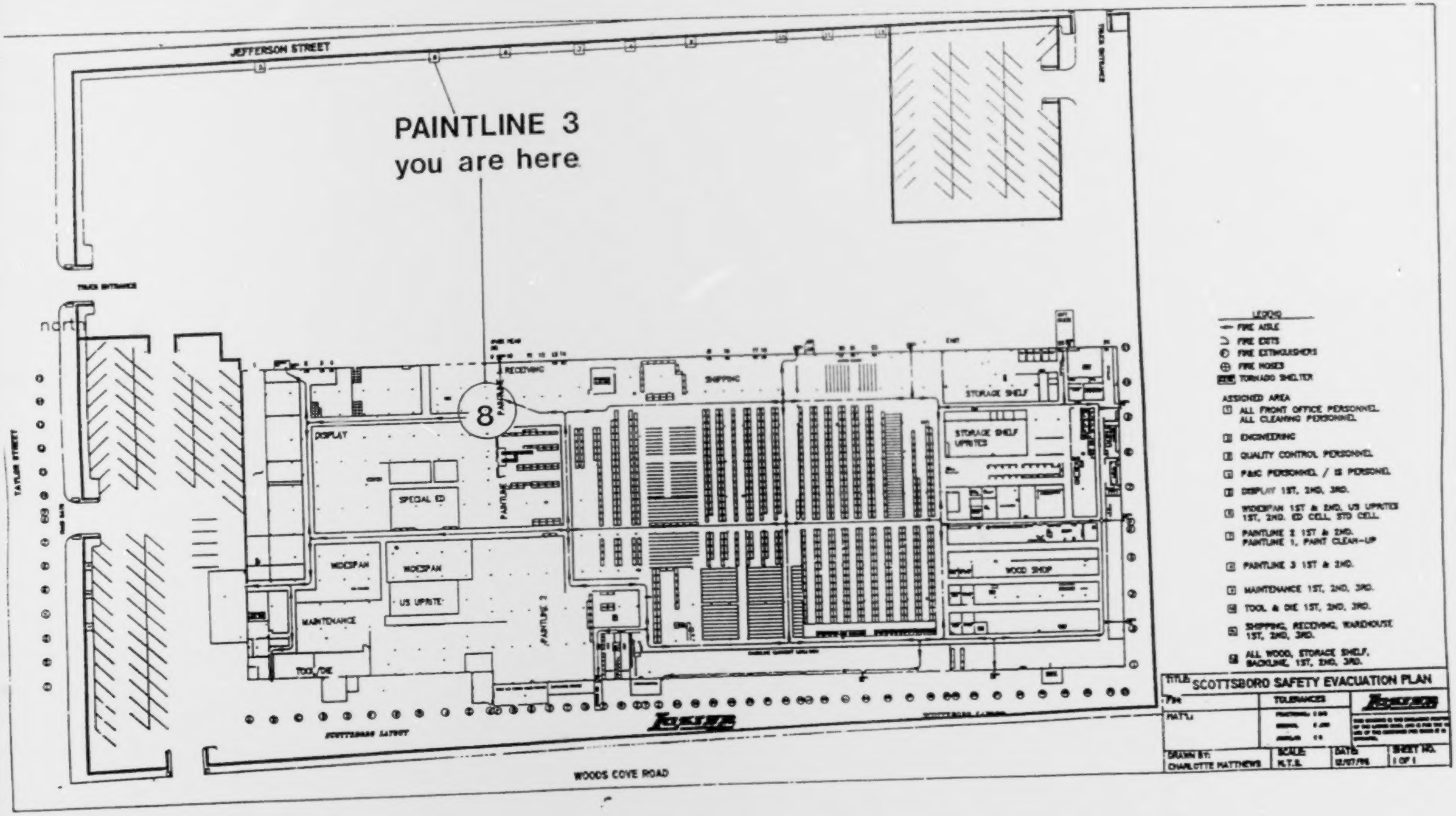
SHEET NO. 1 OF 1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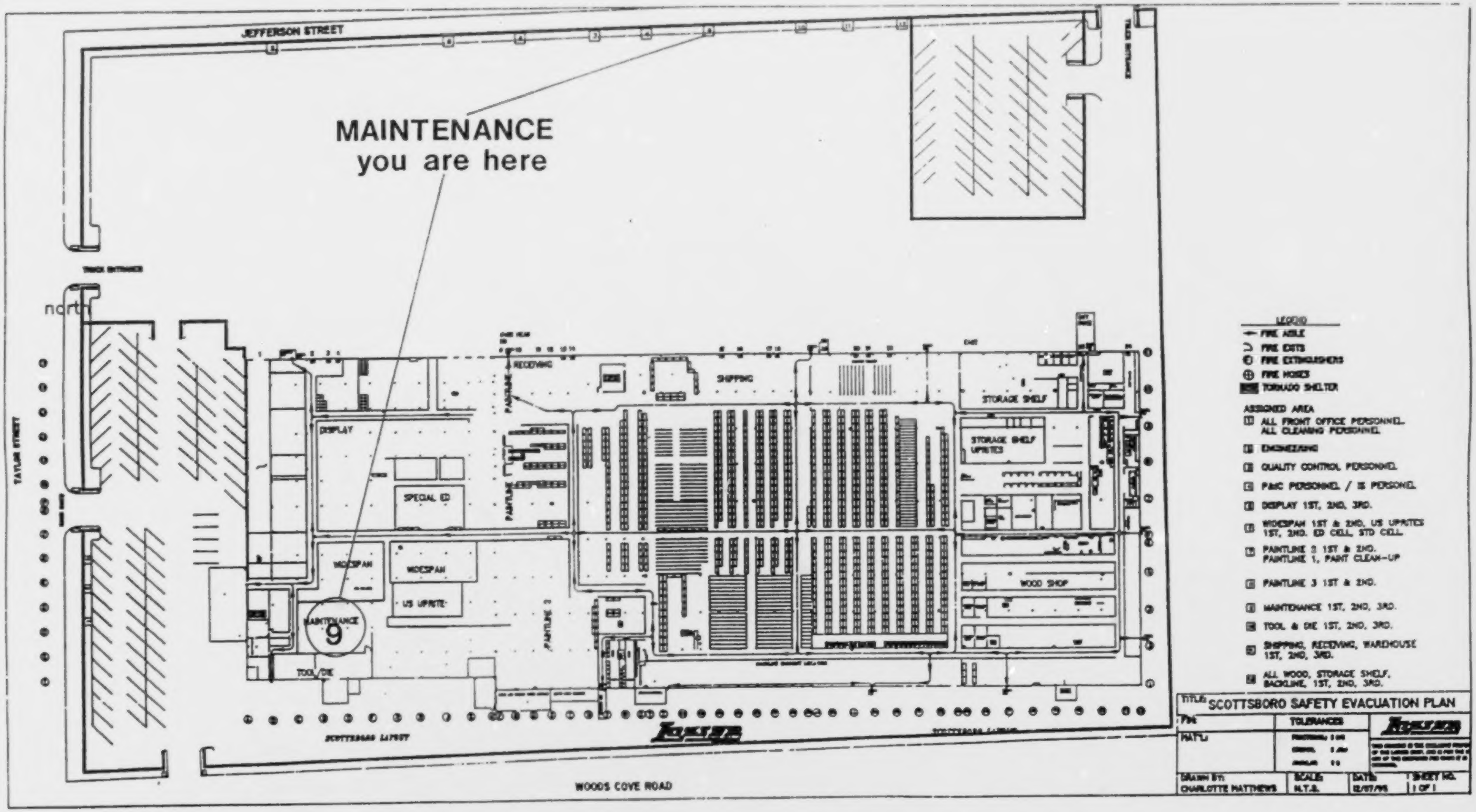
STORAGE SHELF UPRITES
DISPLAY
SPECIAL ED
PAINTLINE
WIDESPAN
WIDESPAN
US UPRITE
MAINTENANCE
PAINTLINE 2
TOOL/DIE
WOOD SHOP
EXIT
SCOTTSBORO LAYOUT
WOODS COVE ROAD
LEGEND
FIRE AISLE
FIRE EXITS
FIRE EXTINGUISHERS
FIRE HOSES
TORNADO SHELTER
ASSIGNED AREA
ALL FRONT OFFICE PERSONNEL. ALL CLEANING PERSONNEL.
ENGINEERING
QUALITY CONTROL PERSONNEL
P&IC PERSONNEL / IS PERSONNEL
DISPLAY 1ST, 2ND, 3RD.
WIDESPAN 1ST & 2ND, US UPRITES 1ST, 2ND. ED CELL, STD CELL
PAINTLINE 2 1ST & 2ND. PAINTLINE 1, PAINT CLEAN-UP
PAINTLINE 3 1ST & 2ND.
MAINTENANCE 1ST, 2ND, 3RD.
TOOL & DIE 1ST, 2ND, 3RD.
SHIPPING, RECEIVING, WAREHOUSE 1ST, 2ND, 3RD.
ALL WOOD, STORAGE SHELF, BACKLINE, 1ST, 2ND, 3RD.
TITLE: SCOTTSBORO SAFETY EVACUATION PLAN
TOLERANCES
DRAWN BY: CHARLOTTE MATTHEWS
SCALE: N.T.S.
DATE: 12/07/96
SHEET NO. 1 OF 1



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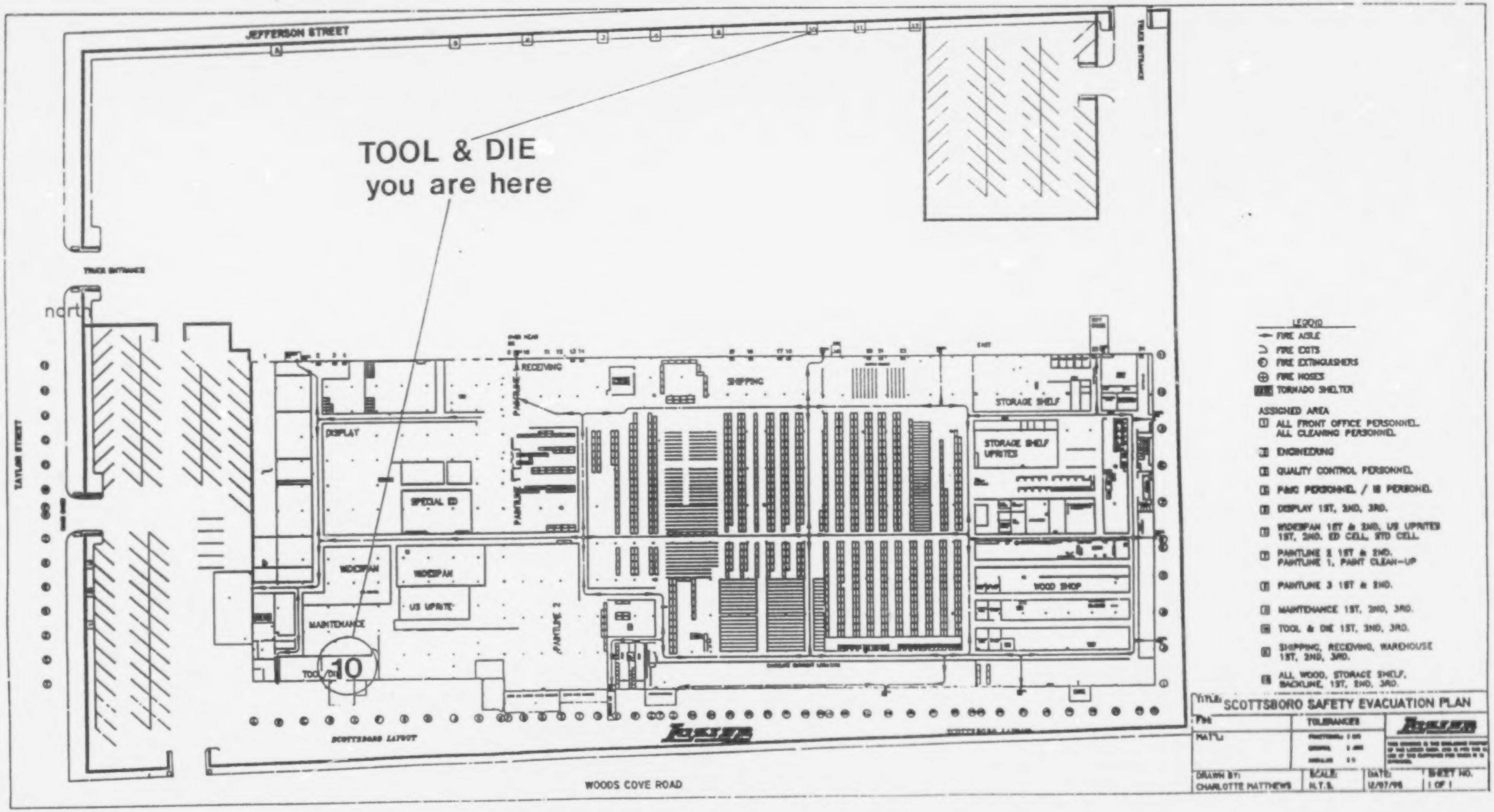
JEFFERSON STREET
TRUCK ENTRANCE
TOOL & DIE
you are here
north
TAYLOR STREET
DISPLAY
SPECIAL ED
RECEIVING
SHIPPING
STORAGE SHELF
STORAGE SHELF UPRITES
WIDESPAN
US UPRITE
MAINTENANCE
TOOL & DIE
10
PAINTLINE 2
WOOD SHOP
SCOTTSBORO LAYOUT
WOODS COVE ROAD
LEGEND
FIRE AISLE
FIRE EXITS
FIRE EXTINGUISHERS
FIRE HOSES
TORNADO SHELTER
ASSIGNED AREA
ALL FRONT OFFICE PERSONNEL. ALL CLEANING PERSONNEL.
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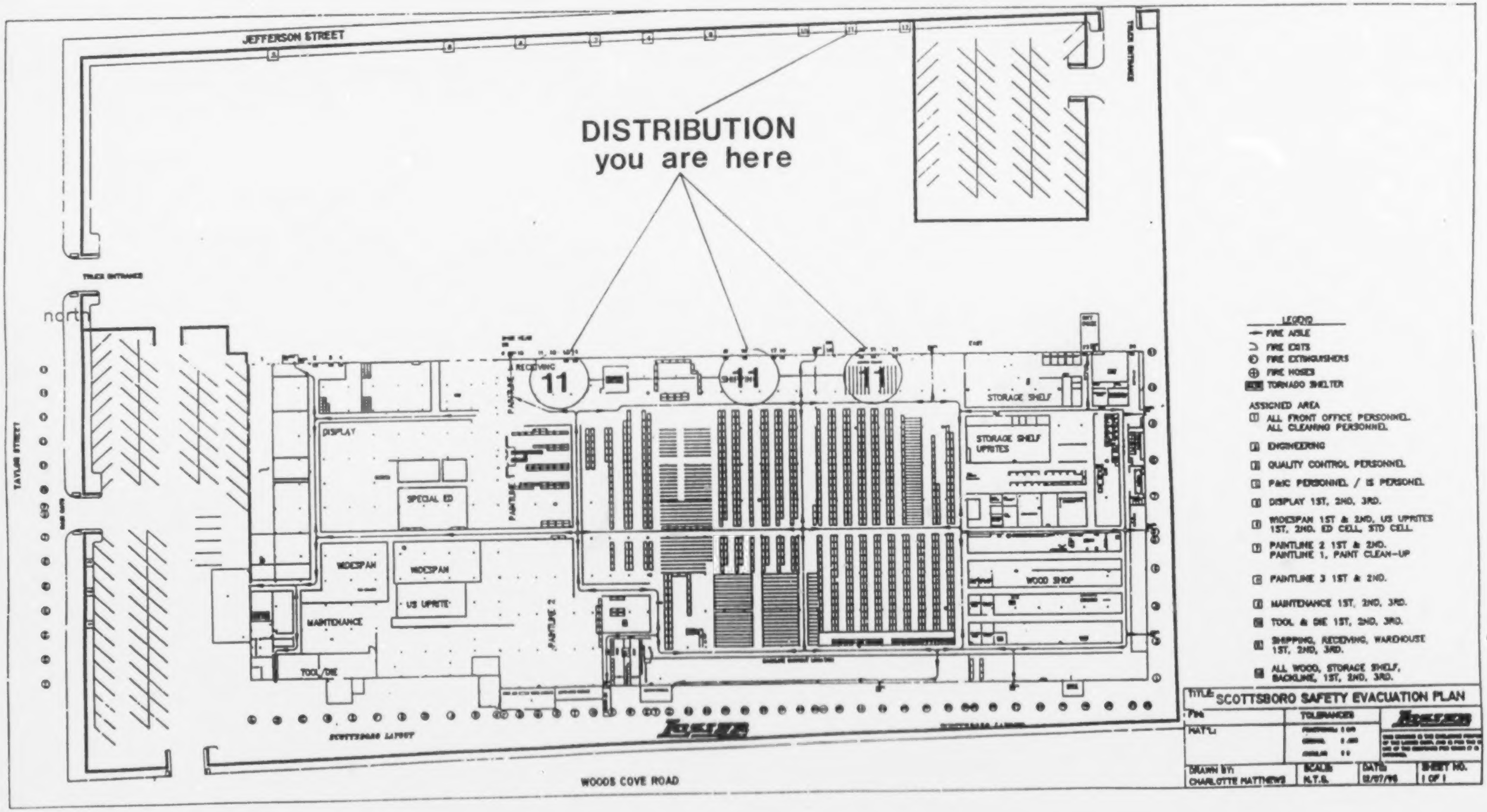

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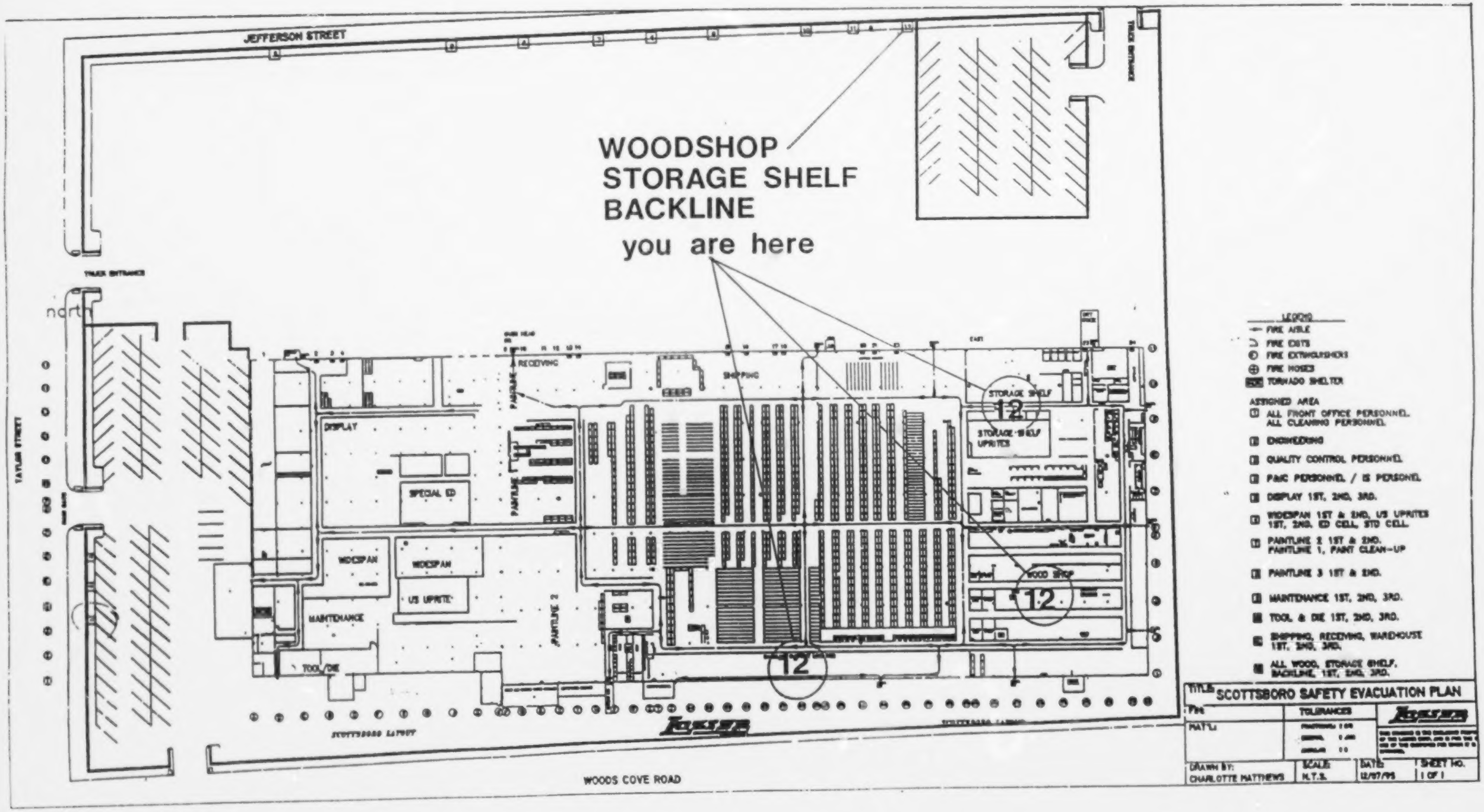

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Housekeeping

WHY IS IT IMPORTANT?

Good housekeeping is an important safety issue. Many of the potentially dangerous materials, tools, and substances we work with are lying in wait for trouble in the work area. Even items that aren't really hazardous can become so when they're left lying around where people can trip over them or bump into them.

Good housekeeping has other virtues. When your work area is clean and neat, it's a lot easier to find what you need and do your job efficiently. It also makes it much easier to respond or get out fast in an emergency.

Good housekeeping is everyone's responsibility. Good housekeeping has to be constant and ongoing if it's going to prevent and eliminate hazards in your work area.

Think about it........
Most of us spend more waking hours at work than we do at home. A neat and orderly work place is a safer and more pleasant work place!

General Hazards

Almost any hazard that can exist at work can exist in your work area. A fair percentage of them can be prevented by keeping things where they should be and keeping the area clean. Among the hazards that good housekeeping can help prevent are:

- Fire
- Getting hit by objects
- Punctures, splinters, and cuts
- Tripping and falling
- Chemical exposure and spills
- Chemical reactions

Housekeeping's role in safety is to prevent and remove hazards by keeping the work area in good condition continually, not just on an occasion when you have nothing better to do.

Identifying Hazards

There are several types of hazards of which you should be continually alert so that they can be eliminated immediately. If you train your eyes to look for these hazards, you can eliminate them before they cause trouble.

Tripping and falling hazards occur when anything is placed on the floor that doesn't belong there: machines, tools, cords, cables, air hoses, scrap, boxes, etc. Floors should be kept clear. You can protect yourself and others from tripping and falling hazards by not keeping anything that doesn't belong, even temporarily, on the floor. Every machine and tool, every material and substance we use belongs in some specific place.

Keeping the floor clear is, of course, especially important in aisles and passageways.

Did you know......
More than 200,000 people in the United States are injured on the job from slips, trips, and falls every year.

Contact hazards are created by objects that can hit you or that you can bump into. Open drawers and tools left perched precariously on a table are typical examples. Contact hazards can be prevented by putting things away properly. Don't leave tools or materials on the edge of a surface where they can fall. Don't leave drawers open where someone can bump into them. Put things where they belong!

Puncture and splinter hazards exist when sharp-edged or pointed tools are left out of place. Splinters can develop on any surface or on a variety of materials. There is no excuse for leaving sharp or pointed objects lying around where someone - *like you* - could find them in a hand or even an eye!

Splinters are a little less obvious. To avoid splinters, if you find a rough edge, either cover it or sand it off.

Electrical hazards that you are likely to find include: overloaded circuits, extension cords, and cords left near heat or water. Anything that could cause fire or shock is an electrical hazard.

Protect *yourself* and *others* from electrical hazards by knowing the basics of electrical safety. Don't overload circuits and be sure you're using the correct plug in the correct outlet. Make sure wiring insulation is intact. Extension cords are to be used only for temporary purposes. **Never** leave a cord near heat or water.

Chemical exposure or spills are always a risk when chemical containers are in the work area, especially if they're left open. Chemical reactions can occur if the chemicals in the work area are allowed to mix with things that will cause dangerous reactions such as other chemicals, water, or air.

To prevent chemical spills, inspect containers regularly to make sure there are no leaks. If there is a small spill, clean it up immediately according to the procedures on the MSDS and our company policy.

Fire Hazards are reduced when you practice electrical safety and keep an eye out for anything in the work area that could burn.

If you're working with flammable liquids, make sure they're kept in approved flammable liquid containers and that they are never kept near an ignition source.

Watch out for flammable scrap, such as oil soaked rags. These should be disposed of in approved flammable solid containers that are emptied daily.

You accomplish another part of fire safety when you eliminate tripping and falling hazards. If there is a fire, the aisles and passageways must be clear so you can get out and firefighters can get in. You should also keep this in mind when you stack materials; don't pile them so high they interfere with the sprinklers.

Disposing of general trash properly and promptly will reduce fuel sources in the event of a fire. Overflowing trash cans and hoppers just add fuel to the fire and are considered a fire hazard.

Here are some extra housekeeping tips to keep in mind:

- Dispose of food and drinks out of the work area. These can be contaminated by chemicals, attract bugs, and add to the general clutter.
- Don't keep scraps of miscellaneous items just because you feel these might come in handy someday. If you really think you can use them, choose a shelf or drawer, label it, and keep the items there.

It's not hard to keep your work area clean, uncluttered, and safe – and it makes for much more pleasant and productive working conditions!

Remember – Everything has its place and should be put there.

Cleanliness + Organization = Good Housekeeping

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Attachment D

Good Housekeeping Safety Checklist

- Keep all tools and materials in their proper place when not it use.
- Keep sharp edges covered or enclosed.
- Keep the floor clear at all times.
- Keep cords, cables, and air hoses from becoming a tripping hazard.
- Avoid stacking materials in aisles, passageways, or to close to sprinklers.
- Close all drawers.
- Cover or sand off splinters.
- Use permanent wiring, not extension cords, whenever possible.
- Keep wires and cords untangled.
- Keep cords away from heat and water.
- Keep flammable liquids in approved flammable liquid containers and away from ignition sources.
- Clean up spills immediately.
- Dispose of oily rags in approved flammable solid containers that are emptied daily.
- Remove only necessary quantities of chemicals from containers.
- Make sure all chemical containers are labeled.
- Keep chemical containers closed when not in use.
- Check chemical containers regularly for leaks.
- Don't let grease or dirt build up on floors or surfaces.
- Report holes, loose boards, and other flooring problems.
- Throw away trash promptly and properly.

Directions: ***Read the following scenarios and determine if the correct decision was made.***

Scenario 1

Jeremy was told by a co-worker that the "thunder storm warning" in effect for Scottsboro had been upgraded to a "tornado watch". Jeremy informed the other workers in his area, and they immediately went to the designated tornado shelter area.

Did they follow the correct procedure? ______________

Why or why not?

Scenario 2

James clocked in at 2:30 p.m. in the storage shelf department. At 4:00 p.m. he was asked to help in another area. At 5:15 p.m. the fire alarm (continuous blast) sounded. James left the building at the nearest exit in the area he was working and remained at the designated location for the workers in that area.

Did he follow the correct procedure?___________

Why or why not?

Attachment F

SAFETY WORKSHEET

Directions: Read the definitions below and place the correct word in the blank provided.

All Clear
Emergency Coordinator
Fire Exits
Intermittent Blast
Severe Weather Warning
Tornado Watch
Continuous Blast

Designated Area
Evacuation Point
Fire Extinguisher
Legend
Tornado Shelter
Utilities Personnel
Hazard Hunt

Emergency
Fire Aisle
Housekeeping
Procedure
Tornado Warning
Hazard

1.____________________ Person who will shut down all necessary main power and or gas supplies prior to going to their designated shelter.

2.____________________ Local weather activity.

3.____________________ Signal given by weather radio or the Emergency Coordinator that the building for area has been cleared.

4.____________________ Confirmed sighting of a tornado in the local area.

5.____________________ Person responsible for implementing proper evacuation procedures for Lozier employees.

6.____________________ Weather conditions are favorable for a tornado.

7.____________________ An alarm advising all employees to evacuate the building.

8.____________________ Periodic inspections to identify possible hazards.

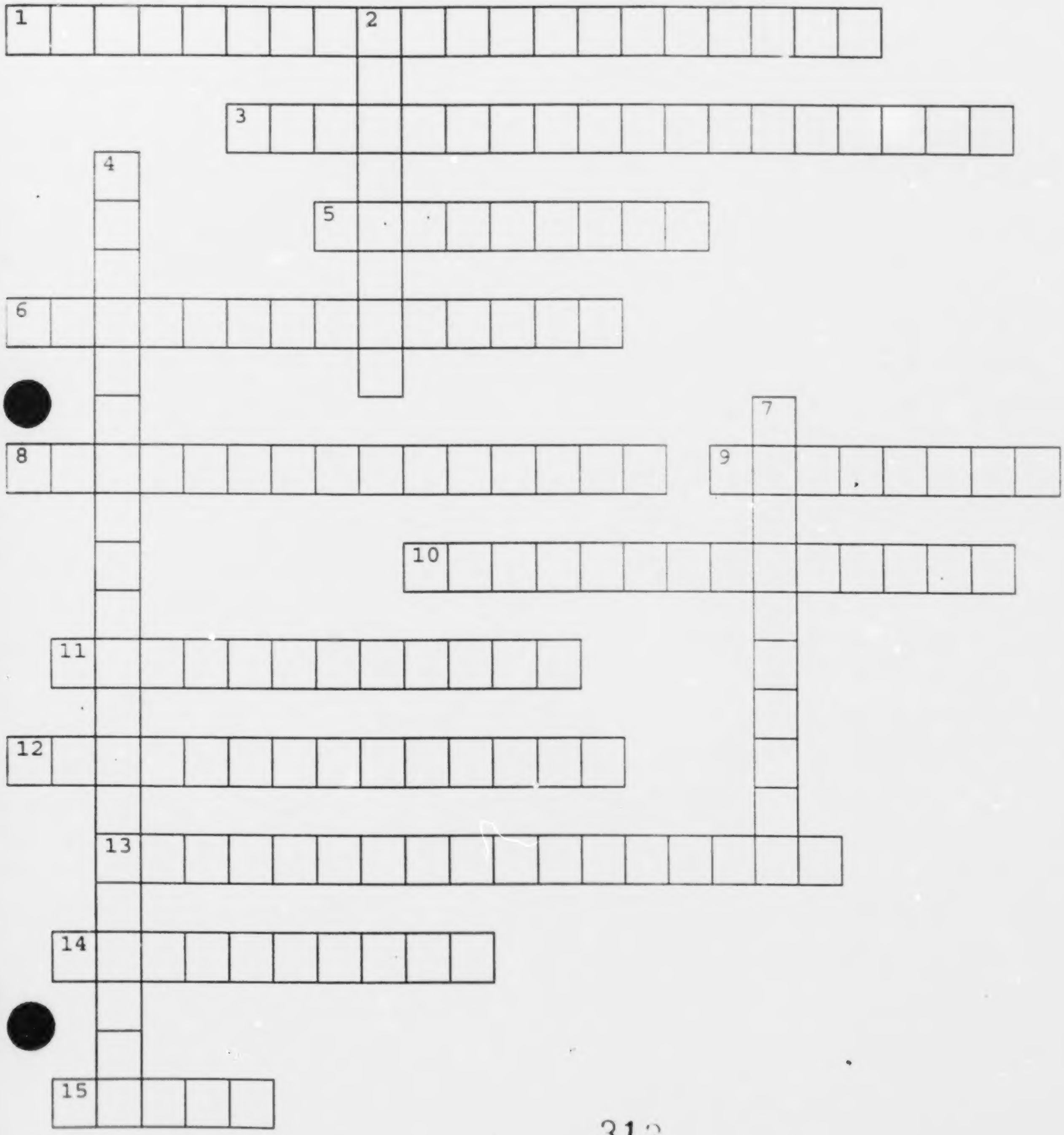
9.____________________ Designated location within the plant that employees report to in case of severe weather.

10.____________________ An alarm advising all employees that a Tornado Warning has been issued and to report to their designated area.

Attachment G

Safety Level 3
Crossword Puzzle

Using the clues provided, work the crossword puzzle.



ACROSS

[illegible] Local weather activity. (3 words)
[illegible]. Person who will shut down all necessary main power and or gas supplies prior to going to their designated shelter. (2 words)
5. Dispose of oily rags in approved ___________ solid containers that are emptied daily.
6. Confirmed sighting of a tornado in the local area. (2 words)
8. An alarm advising all employees to evacuate the building. (2 words)
9. Dont's let grease or dirt build up on floors or _________.
10. Use permanent wiring, not ____________ ______ whenever possible. (2 words)
11. Weather conditions are favorable for a tornado. (2 words)
12. Designated location within the plant that employees report to in case of severe weather. (2 words)
13. An alarm advising all employees that a Tornado Warning has been issued and to report to their designated area. (2 words)
[illegible]4. Periodic inspections to identify possible hazards. (2 words)
15. Throw away ______ promptly and properly.

DOWN

2. Signal given by weather radio or the Emergency Coordinator that the building or area has been cleared. (2 words)
4. Person responsible for implementing proper evacuation procedures for Lozier employees. (2 words)
7. Remove only necessary __________ of chemicals from containers.

Introduction to Lozier One

- Lozier History
- Defining our business

Module: **Introduction to Lozier** **Overall Time 50 min.**
Job Title: **New Hires/General** **Page 1 of 2**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Upon completion of instruction, the learner should be able to list at least four Lozier customers and list Lozier's four main product lines with 100% accuracy.	**Motivational Activity:** Learners will select an item from either a paper bag or a clear plastic bag. Discussion on how many chose the items from the see through bag verses the other bag.	5 min	A brown paper bag filled with miscellaneous items, and a clear plastic bag filled with candy.	Discussion
	Vocabulary: Present key words using overhead transparency and discuss the meaning of each.	5 min	Overhead projector, Attachment A	Participation
	Instructional Activity: Discussion on how starting a new job could be considered the unknown. Instructor will link old knowledge to new knowledge. Discuss the past, present, and future of Lozier.	10 min	Attachments B and C	
	Guided Practice: Using overhead transparencies, identify and discuss Lozier's customers and product lines.	15 min	Attachments D,E,F,G,H,I,J	Participation
	Independent Practice: Learners will complete worksheets independently.	10 min	Attachment K and L	Instructor will check for accuracy
	Evaluation: Check worksheets.	5 min		

LOZIER CORPORATION

Job Title: New Hires/General

Module: Introduction to Lozier

General Instructional Objective: Familiarize each employee with a brief history of Lozier Corporation, its customers, and product lines.

Specific Instructional Objective: The learners should be able to list at least four Lozier customers and list the four main product lines with 100% accuracy.

Motivational Activity: Teacher will place two bags, one being clear plastic, on a table. The plastic bag will be filled with a variety of candy bars; the other bag will be filled with miscellaneous items. Learners will choose an item from either bag. Discussion on how many chose the items from the see through bag versus the other bag showing selection of the known from the unknown.

Vocabulary: Teacher will use overhead transparency to present key words and discuss their meanings (Attachment A)

Instructional Activities: Teacher will lead discussion on how starting a new job can be considered the unknown. Being informed about the history, customers, and main products of the company will help acquaint the new employee with the unknown (new job).

Guided Practice: Teacher will use overhead transparencies to present past, present, and future of Lozier Corporation, and to discuss Lozier customers and product lines (Attachments B, C, D)

Independent Practice: Learners will complete worksheets (Attachments E and F).

Evaluation: Teacher will check completed worksheets.

Attachment A

KEY WORDS

Candor – Frankness of opinion; sincerity

Capital investment – Funds expended for additions or improvements to plant or equipment.

ERP – **E**nterprise **R**esource **P**lanning is the process by which all business enterprises can be brought into the planning/execution cycles.

Lead time – The time (in working days) needed from receipt of an acceptable order to manufacture and ship, based upon time and the season of the year.

Integrity – Honesty, goodness, firm adherence to values.

Integrated systems – Processes joined together with the abiltiy to communicate and provide input to the business as a whole.

Merchandising systems – A group of interrelated components designed to promote the sale of our customers' products.

Quality – Maintaining proper standards in order to produce a product that meets customers needs, expectations, safety requirements and is cost effective.

Suppliers – The preferred term for Lozier vendors; where we purchase our materials.

Attachment B

LOZIER

Lozier is the nation's largest manufacturer of retail merchandising systems.

The employees in our five locations (Omaha, Nebraska; Scottsboro, Alabama; Joplin, Missouri; McClure, Pennsylvania;and Pittsburgh, Pennsylvania) provide our customers with a variety of products that maintain Lozier's reputation for quality, dependability and service.

Our sales force, located strategically throughout the United States, is trained to provide complete customer service. Not only are they experienced in store fixturing, but they understand retail merchandising, and will follow through on customer orders from start to finish.

Lozier is built on a solid foundation of providing a quality product to our many valued customers.

Attachment C
Page 1 of 5

Lozier Corporation

Headquarters in Omaha, NE

Our Past

Lozier is a privately held corporation, incorporated in 1956. Sales in 1957 were $300,000. We have seen steady increases in both sales and earnings since then. Manufacturing facilities in 1956 were about 20,000 square feet for a very small product line, basically serving food stores.

Lozier purchased the present Scottsboro building from a company that manufactured vending machines in 1972. In 1974, Lozier shipped $1.3 million of products from the Scottsboro plant. This was a record breaking year. In 1977, Lozier began making show cases in the woodshop.

Our Present

In 1996, our facilities comprise over 2,000,000 square feet at various locations. Over 2,500 people are employed at Lozier, compared to 25 when the company was first established. Current sales exceed $300 million of which $100 million is produced at the Scottsboro plant.

Our Future

Three major capital investments are planned for 1996 and 1997 at the Scottsboro plant. The projects are:

1. Warehouse re-layout
2. Adding a welder and roll forming process to the shelving department
3. Adding a paint booth to paint line 3 (will be able to paint up to 8 colors)

The major company wide project the coming year will be **ERP (Enterprise Resource Planning)**. ERP is a system which integrates processes from all areas of the business (HR, Sales, Purchasing, Scheduling, Accounting, Manufacturing). With integrated systems, proper planning can take place to reduce expediting, better utilize resources, and improve customer service.

The employees who manufacture product on the shop floor will be responsible for entering accurate data into the system (i.e., inventory transactions). All departmental processes will depend on accurate information from the shop floor.

Employees will see changes in their daily activities starting as early as the 4th quarter of 1997 and 1998. With these changes, the employee will become responsible for inputing data into the system at all phases of the manufacturing process. Eventually employees will become users of the system.

Locations and Product Lines

Date Acquired or Built	Plant	Location	Major Products or Product Lines
1963-67	West Plant	Omaha, NE	Pallet Rack, Storage Systems, and Standard Shelving
1964	Lozier-McClure	McClure, PA	Wire Products and Pharmacy Fixtures
1968	Lozier -Joplin	Joplin, MO	Tubular and Chrome Plated Products, T-System Merchandising Racks, and Point of Purchase Fixtures
1969	North Plant	Omaha, NE	Wood Products, and Backline Standard Shelving
1972	Lozier-Scottsboro	Scottsboro, Al	Wide Span, Wood Products, Storage Shelving and Standard Shelving
1978	Service Center	Cucamunga, CA	Service Center
1983	Distribution Center	Omaha, NE	Warehouse
1989	Main Office	Omaha, NE	Headquarters
1991	Lozier	Pittsburgh,PA	Lozier Components
1995	North II	Omaha, NE	Start up in 1997

OUR PURPOSE

Anticipate and satisfy our customers' needs for a supplier of high value merchandising systems, while serving the needs of all our stakeholders. Build winning long-term partnerships with employees, customers, suppliers, and our communities. Strengthen teamwork through emphasis on our shared values of integrity, candor, open-mindedness, work, community, and family.

With changes in technology and capital investments, employees must be willing to adapt to change (be open-minded). To accomplish this, people must be willing to change – to learn new tasks and expand their knowledge through training.

As we define the shared values (integrity, candor, open-mindedness, etc.), we can see that by incorporating these values we strengthen teamwork.

OUR CUSTOMER'S NEEDS

High Quality, Competitive Products	**A given**
Friendly, Error-free Transactions	**99%+**
Responsive Lead Times	**< 3 weeks**
"High Value" Prices	**Lowest Price for Above**

Quality *products have to be a "given"! An inferior product will lose customers fast! Our competitors all have high quality products. Our quality standards must be top priority.*

Our competitors' ***lead time*** *is 3 weeks. Our lead time is currently less than 3 weeks (2 or 3 days better than our competitors).*

High value prices *are important. Any change in prices are usually justified with increases in material prices (steel, lumber, etc.). This means that we all have to look for ways to improve the business and keep costs down to support salary increases and other capital investments.*

OUR VISION

Service and Products delivered with such reliability that successful retailers overwhelmingly choose Lozier.

Reliable service and product means always meeting the customer's needs with quality product, delivered fast, friendly, and on-time for the right price.

We dominate the automobile parts store industry ... We want to dominate the grocery store industry!

"DO WELLS"

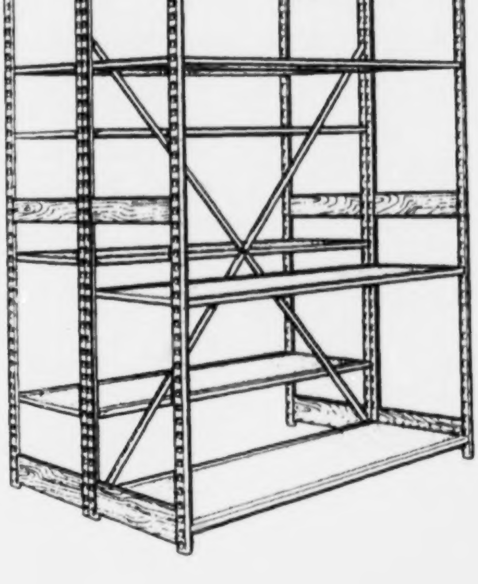
These are the things Lozier feels we must "do well" in order to succeed.

Select Winning Customers • Listen to what the customer says • Select situations that fit • Anticipate the future • Review and re-position	**Examples:** Lozier doesn't want to do business with customers who are in financial trouble. **OR** Wal-Mart might want to place a large order but wants a time frame we can't meet without hurting our long term, reliable customers. We would choose not to except the Wal-Mart order.
Lowest Cost • Continuous improvement culture • Efficient processes • Appropriate technology • Simplicity rules	Lozier is known for being a "frugal" company. It is our intention to increase productivity by 8% each year. This is done by improving machines, processes, and people capability. A culture of continuous improvement is necessary to stay competitive and still be financially able to reward employees and invest in the business.
Hassle-free Transactions • Friendly people • Fast cycle time • Error-free • Timely, accurate information	All of these areas affect each of our jobs at Lozier.
Partnering With Our Co-Workers • Fair Play • Invest in education and development • Open communication • Pride	Lozier offers tuition reimbursement as well as education and training opportunities such as the APT program. We have a formal performance review process for all employees which provides feedback to improve in their jobs. We have pride in our employees and we expect them to have pride in the work that they do. We also take pride in our reputation of being a stable company that contributes to the community.
Bottom Line: All of the above must add up to an organization that will grow its capabilities faster than the competition. We can't stand **still!**	This means "growing" what the **company** can do, what our **people** can do, and what our **machines, systems**, and **processes** can do.

STORAGE SHELVING

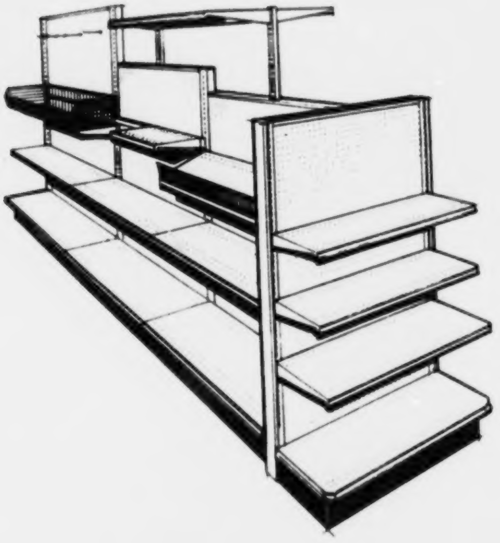
Storage shelving is used primarily in backroom areas and behind the counters in auto parts stores. This product is also available in a number of sizes. It is manufactured from galvanized steel.

Storage shelving is designed for light duty hand stack and pick loads. Lozier provides a range of Storage Systems that go up easy and stay up strong.



DISPLAY SHELVING

Display shelving is used primarily to merchandise products available to the consumer and is our most popular product line. This line is provided to our customers in an array of colors and sizes.

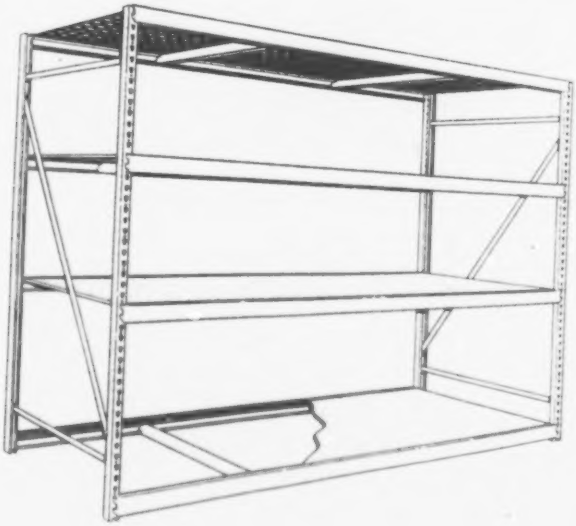


Lozier provides **Display shelving** options and accessories for high powered merchandising in a wide variety of retailing formats.

WIDESPAN

Widespan is used primarily in backroom storage areas. It is also used to merchandise products in "showrooms". Typically, widespan used in backrooms is painted a simple gray color. Widespan used in showroom areas is painted in a vibrant color.

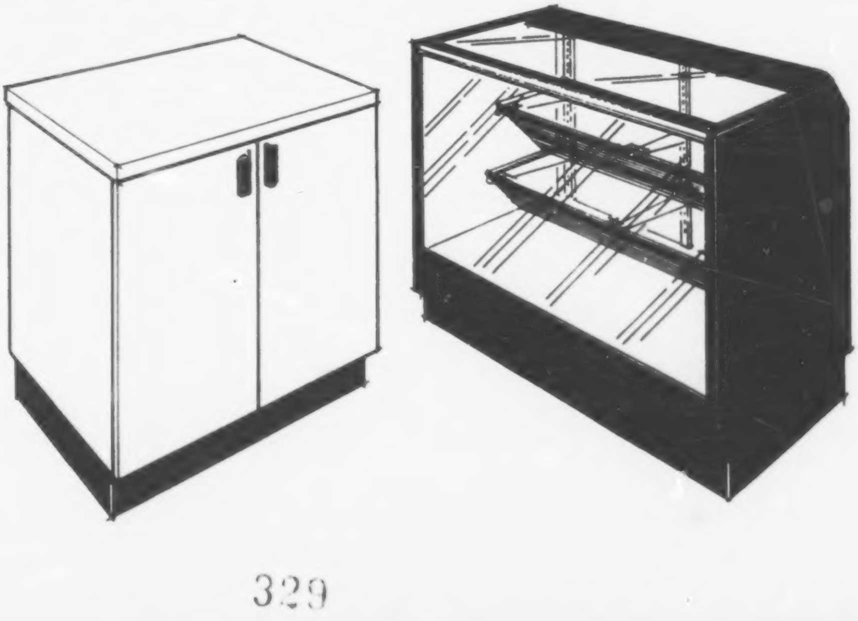
Widespan is designed for medium duty hand stack loading for heavier loads.



WOOD PRODUCTS

Wood products are used primarily to merchandise products. This product line makes up a very small percentage of Lozier's business but is used by some of our more significant customers (such as NAPA, BI LO, and ALBERTSON'S).

Wood showcases and counters are designed for good looks and long-term durability. Lozier offers a variety of Modular Showcases, Counters, and Free-Standing Displays.



Attachment E

HOW MUCH DO YOU REMEMBER?

Choose the letter that best completes the following statements. Write your answer in the blank space.

______1. Lozier purchased the Scottsboro building from a company that manufactured vending machines.

______2. It is necessary that Lozier "do this well" in order to maintain low cost for its customers.

______3. Used primarily behind counters in auto parts stores and in backroom areas.

______4. Used primarily to merchandise products. Most popular Lozier product line.

______5. Sometimes used in "showrooms" and sometimes painted vibrant colors.

______6. Service and products delivered with such reliability that successful retailers overwhelmingly choose Lozier.

______7. Process by which all business processes can be brought into the planning/ execution cycles; a major company project.

______8. Integrity, candor, open-mindedness, work, communication, and family.

______9. Honesty, adherence to values.

______10. High quality, Competitive Products, Friendly, Error-Free Transactions, Responsive Lead Times, "High Value" Prices.

A. Integrity

B. Display shelving

C. Widespan

D. Lozier's Vision

E. 1972

F. ERP

G. Continuous improvement culture

H. Storage shelving

I. Lozier Shared Values

J. Lozier Customer Needs

Attachment E
Answer Sheet

HOW MUCH DO YOU REMEMBER?

Choose the letter that best completes the following statements. Write your answer in the blank space.

__E__	1.	Lozier purchased the Scottsboro building from a company that manufactured vending machines.	A. Integrity
__G__	2.	It is necessary that Lozier "do this well" in order to maintain low cost for its customers.	B. Display shelving
__H__	3.	Used primarily behind counters in auto parts stores and in backroom areas.	C. Widespan
__B__	4.	Used primarily to merchandise products. Most popular Lozier product line.	D. Lozier's Vision
__C__	5.	Sometimes used in "showrooms" and sometimes painted vibrant colors.	E. 1972
__D__	6.	Service and products delivered with such reliability that successful retailers overwhelmingly choose Lozier.	F. ERP
__F__	7.	Process by which all business processes can be brought into the planning/ execution cycles; a major company project.	G. Continuous improvement culture
__I__	8.	Integrity, candor, open-mindedness, work, communication, and family.	H. Storage shelving
__A__	9.	Honesty, adherence to values.	I. Lozier Shared Values
__J__	10.	High quality, Competitive Products, Friendly, Error-Free Transactions, Responsive Lead Times, "High Value" Prices.	J. Lozier Customer Needs

Attachment F

Important Things to Remember!

Name four customers Scottsboro Lozier supplies with store fixtures.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

Name the four main product lines discussed in today's lesson.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

List two things you can do daily in your job to support Lozier's purpose and customer needs.

1. ________________________________
2. ________________________________

FRACTIONS REVIEW

FRACTIONS PREVIEW

The following is a preview of the fractions unit that will be covered in the Lozier Training and Development program.. Let's see how much you already know!

Answer the following problems and reduce to lowest terms.

1.

$$\begin{array}{r} \frac{21}{25} \\ -\frac{16}{25} \\ \hline \end{array}$$

2.

$$\begin{array}{r} \frac{5}{7} \\ -\frac{2}{3} \\ \hline \end{array}$$

3.

$$\begin{array}{r} 4\frac{1}{18} \\ -1\frac{7}{18} \\ \hline \end{array}$$

4.

$$\begin{array}{r} 5\frac{3}{8} \\ -1\frac{7}{12} \\ \hline \end{array}$$

5.

$$\begin{array}{r} 83\frac{5}{6} \\ +29\frac{7}{8} \\ \hline \end{array}$$

6.

$$\begin{array}{r} 5\frac{4}{9} \\ +2\frac{7}{9} \\ \hline \end{array}$$

7. $\frac{5}{9} \text{ X } \frac{2}{5} =$

8. $2\frac{3}{4} \text{ X } \frac{6}{7} =$

FRACTIONS PREVIEW

9. $\frac{3}{16} \div \frac{9}{32} =$

10. $\frac{4}{9} \div 1\frac{1}{4} =$

11. $\frac{5}{6} \div 12 =$

12. Which fraction is larger, $\frac{6}{8}$ or $\frac{4}{5}$? ____________

13. Which fraction is larger, $\frac{1}{4}$ or $\frac{6}{7}$? ____________

14. Which fraction is smaller, $\frac{1}{4}$ or $\frac{1}{3}$? ____________

15. Which fraction is smallest, $\frac{1}{6}$, $\frac{1}{5}$, or $\frac{7}{30}$? ____________

16. Among the fractions $\frac{3}{4}$, $\frac{5}{6}$, and $\frac{2}{3}$, which is equal to $\frac{18}{24}$? ____________

17. Between the fractions $\frac{1}{8}$ and $\frac{2}{3}$, which fraction is larger than $\frac{5}{24}$? ____________

FRACTIONS PREVIEW

18. Two screws were measured. Screw X measured $\frac{1}{4}$ or an inch. Screw Y measured $\frac{1}{2}$ inch. Which screw was longer? __________

19. Is $\frac{1}{4}$ of a dozen greater than, less than, or equal to $\frac{3}{12}$ of a dozen? __________

20. Larry has three pallets of shelves. The shelves are 13 feet long. He wants to cut the shelves to make 4 smaller shelves of equal length. How many smaller shelves can be cut? Express your answer as a whole or mixed number. ______________

DRAFT

Module: Fractions
Job Title: General/New Hires

Overall Time: 2 Hours
Page 1 of 1

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners will complete the fraction unit with 90% accuracy.	**Motivational Activity:**. Display several items (football, money, and a clock). Initiate discussion about using fractions in everyday activities.	5 min	Ball, Money, and Clock	Discussion
	Vocabulary: Review vocabulary terms orally and visually using a transparency.	5 min	Overhead Projector, and Transparency (Attachment A)	Observation
	Instructional Activity: Instructor will lead discussion relating to using fractions in everyday activities including work.	5 min		Participation
	Guided Practice: Instructor will demonstrate the steps used when working with fractions.	20 min		Observation
	Independent Practice: Learners will work various worksheets involving adding, subtracting, multiplying, and dividing fractions.	50 min		Teacher will check for accuracy.
	Evaluation: Instructor will evaluate by observation. If learners have difficulty the instructor will review each step in detail.	15 min		Observation

LOZIER CORPORATION

Job Title: **General/New Hires**

Module: **Math - Fractions**

General Instructional Objective: Learners will be able to identify and use fractions in their work environment..

Specific Instructional Objective: Learners will complete the fraction unit with 90% accuracy.

Motivational Activity: The instructor will display several items such as a football, money and a clock. Initiate an instructor led discussion about using fractions in everyday activities.

Vocabulary: The instructor will review vocabulary terms (Attachment A) orally and visually in order to reinforce knowledge the learners have obtained in previous learning experiences. (Multiplication, Division, Common denominator, Proper fractions, Improper fractions, Mixed numbers, Reciprocals, Equivalent fractions, Nonequivalent fractions, and symbols often used in fractions)

Instructional Activities: The instructor will lead a discussion relating to the many ways we use fractions in everyday activities including work. Ask the learners for a few examples that they can think of when you might use fractions at home? At work?

Guided Practice: The instructor will demonstrate the steps used when adding, subtracting, multiplying, dividing, changing mixed numbers to improper fractions and comparing fractions by cross multiplying.

Independent Practice: The learners will complete various worksheets involving procedures demonstrated in Guided Practice.

Evaluation: The instructor will evaluate by observation. If learners have difficulty, the instructor will review each step in detail.

TAKING A CLOSER LOOK.....

ADDING
&
SUBTRACTING
FRACTIONS

Vocabulary Terms

Symbol	Meaning	Example
$=$	**is equal to**	$4 = 4$
$>$	**is greater than**	$7 > 3$
$<$	**is less than**	$2 < 9$
$\neq$	**not equal**	$\frac{1}{2} \neq \frac{3}{4}$

Common denominator - a number that all the denominators will divide into evenly

Example: $\frac{3}{15}$ $\frac{4}{12}$

Proper fraction - a fraction whose numerator is smaller than its denominator

Example: $\frac{4}{6}$ $4 < 6$

Improper fraction - a fraction whose numerator is greater than or equal to its denominator

Example: $\frac{4}{4}$ or $\frac{9}{4}$

Mixed number - a number with a whole number part and a fractional part

Example: $2\frac{1}{2}$ $5\frac{1}{3}$ $7\frac{1}{8}$ $9\frac{1}{5}$

Equivalent fractions - fractions that equal the same value

Example: $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$

Nonequivalent fractions - fractions that are not equal

Example: $\frac{1}{2} \neq \frac{3}{4}$

Adding and Subtracting Like Fractions

Fractions with the same denominator have a **common denominator.** The fractions $\frac{1}{7}$ and $\frac{6}{7}$ have a common denominator of 7. These fractions are also called **like fractions.**

To add like fractions, follow these steps:

Step 1 Add only the numerators.
Step 2 Use the same denominator in the answer.
Step 3 Write the sum in lowest terms.

Examples

A
$$\begin{array}{r} \frac{7}{10} \\ +\ \frac{1}{10} \\ \hline \frac{8}{10} = \boxed{\frac{4}{5}} \end{array}$$

B
$$\begin{array}{r} \frac{5}{8} \\ +\ \frac{7}{8} \\ \hline \frac{12}{8} = 1\frac{4}{8} = \boxed{1\frac{1}{2}} \end{array}$$

To subtract like fractions, follow these steps:

Step 1 Subtract only the numerators.
Step 2 Use the same denominator in the answer.
Step 3 Write the difference in lowest terms.

Examples

C
$$\begin{array}{r} \frac{7}{10} \\ -\ \frac{1}{10} \\ \hline \frac{6}{10} = \boxed{\frac{3}{5}} \end{array}$$

D
$$\begin{array}{r} \frac{1}{5} \\ -\ \frac{1}{5} \\ \hline \boxed{0} \end{array}$$

Practice

Add or subtract. Write the answers in lowest terms.

$$\begin{array}{r} \frac{3}{11} \\ + \frac{6}{11} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{2}{25} \\ + \frac{23}{25} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{3}{8} \\ + \frac{7}{8} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{13}{15} \\ + \frac{1}{15} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{13}{16} \\ - \frac{11}{16} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{8}{10} \\ - \frac{2}{10} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{21}{25} \\ - \frac{16}{25} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{5}{6} \\ - \frac{2}{6} \\ \hline \end{array}$$

Adding and Subtracting Unlike Fractions

Unlike fractions are fractions with different denominators. Fractions such as $\frac{1}{5}$ and $\frac{3}{10}$ are unlike fractions. Before fractions can be added or subtracted, they must have the same denominator.

To add unlike fractions, follow these steps:		To subtract unlike fractions, follow these steps:	
Step 1	Find a common denominator.	**Step 1**	Find a common denominator.
Step 2	Add the numerators.	**Step 2**	Subtract the numerators.
Step 3	Write the sum in lowest terms.	**Step 3**	Write the difference in lowest terms.

MATH HINT: If the smaller denominator divides evenly into the larger denominator, the larger number is a common denominator. Otherwise, you can multiply the two denominators to get a common denominator.

Examples

A

$$\begin{array}{r} \frac{1}{5} = \frac{3}{15} \\ +\frac{1}{15} = \frac{1}{15} \\ \hline \boxed{\frac{4}{15}} \end{array}$$

Since 15 = 5 X 3, 15 is a common denominator.

B

$$\begin{array}{r} \frac{7}{8} = \frac{21}{24} \\ -\frac{1}{3} = \frac{8}{24} \\ \hline \boxed{\frac{13}{24}} \end{array}$$

Since 3 does not divide evenly into 8, multiply 3 x 8 to get 24 for a common denominator.

Practice

Add or subtract. Write the answers in lowest terms.

$$\begin{array}{r} \frac{1}{12} \\ + \frac{1}{8} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{2}{9} \\ + \frac{1}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{3}{10} \\ + \frac{5}{6} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{5}{7} \\ + \frac{2}{5} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{3}{5} \\ - \frac{1}{3} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{9}{10} \\ - \frac{3}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{5}{7} \\ - \frac{2}{3} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{7}{12} \\ - \frac{1}{3} \\ \hline \end{array}$$

ADDING LIKE MIXED NUMBERS

Numbers such as $1\frac{1}{3}$ and $2\frac{2}{3}$ are **like mixed numbers.** Their fractions have common denominators. To add like mixed numbers, follow these steps:

Step 1 Add the whole numbers.
Step 2 Add the fractions.
Step 3 Write the sum in lowest terms.

A

$$\begin{array}{rll} 1\frac{1}{3} & \text{Step 1:} & 1 + 2 = 3 \\ +\,2\frac{2}{3} & \text{Step 2:} & \frac{1}{3} + \frac{2}{3} = \frac{3}{3} \\ 3\frac{3}{3} = & \text{Step 3:} & 3\frac{3}{3} = 3 + 1 = 4 \end{array}$$

Add the following and reduce your answers to the lowest terms.

$$\begin{array}{r} 8\frac{3}{4} \\ +\,4\frac{3}{4} \\ \hline \end{array} \qquad \begin{array}{r} 8\frac{7}{10} \\ +\,1\frac{3}{10} \\ \hline \end{array} \qquad \begin{array}{r} 7\frac{2}{9} \\ +6\frac{5}{9} \\ \hline \end{array}$$

$$\begin{array}{r} 21\ \frac{11}{18} \\ +21\ \frac{7}{18} \\ \hline \end{array} \qquad \begin{array}{r} 3\frac{2}{7} \\ +\,2\frac{4}{7} \\ \hline \end{array} \qquad \begin{array}{r} 5\frac{4}{9} \\ +2\ \frac{7}{9} \\ \hline \end{array}$$

SUBTRACTING LIKE MIXED NUMBERS

To subtract like mixed numbers, follow these steps:

Step 1 Subtract the fractions, renaming when necessary.
Step 2 Subtract the whole numbers.
Step 3 Write the difference in lowest terms.

Example A

$$\begin{array}{r} 7\frac{5}{7} \\ -\,2\frac{4}{7} \\ \hline 5\frac{1}{7} \end{array}$$

Example B

$$\begin{array}{rcl} 10\frac{4}{9} & = 9\frac{9}{9} + \frac{4}{9} & = 9\frac{13}{9} \\ -\,4\frac{5}{9} & & = 4\frac{5}{9} \\ \hline & & 5\frac{8}{9} \end{array}$$

$\frac{5}{9}$ is greater than $\frac{4}{9}$. To subtract, rename the mixed number, $10\frac{4}{9}$. Use the common denominator to write $10\frac{4}{9}$ as $9 + \frac{9}{9} + \frac{4}{9}$ (the sum of the numerators = $\frac{13}{9}$). $\frac{13}{9}$ is greater than the subtrahend fraction, $\frac{5}{9}$. **Now subtract.**

Step 1 $\frac{13}{9} - \frac{5}{9} = \frac{8}{9}$

Step 2 $9 - 4 = 5$

Step 3 The difference is $5\frac{8}{9}$

Subtract the following and reduce your answers to lowest terms.

$$\begin{array}{r} 4\frac{1}{18} \\ -\ 1\frac{7}{18} \\ \hline \end{array}$$

$$\begin{array}{r} 7\frac{3}{24} \\ -\ 2\frac{11}{24} \\ \hline \end{array}$$

$$\begin{array}{r} 20\frac{13}{18} \\ -\ 4\frac{7}{18} \\ \hline \end{array}$$

$$\begin{array}{r} 23\frac{7}{18} \\ -\ 14\frac{14}{18} \\ \hline \end{array}$$

$$\begin{array}{r} 40\frac{1}{4} \\ -39\frac{3}{4} \\ \hline \end{array}$$

$$\begin{array}{r} 23 \\ -13\frac{15}{25} \\ \hline \end{array}$$

$$\begin{array}{r} 14\frac{3}{14} \\ -11\frac{9}{14} \\ \hline \end{array}$$

$$\begin{array}{r} 4\frac{1}{18} \\ -1\frac{7}{18} \\ \hline \end{array}$$

ADDING UNLIKE MIXED NUMBERS

Numbers such as $3\frac{2}{3}$ and $3\frac{1}{2}$ are **unlike mixed numbers.** They have different denominators. To add mixed numbers with different denominators, follow these steps.

Step 1 Find a common denominator.
Step 2 Add the whole numbers.
Step 3 Add the fractions.
Step 4 Write the sum in lowest terms.

Example A

$$\begin{array}{rcl} 3\frac{2}{3} & = & 3\frac{4}{6} \\ +3\frac{1}{2} & = & 3\frac{3}{6} \\ \hline & & 6\frac{7}{6} = 7\frac{1}{6} \end{array}$$

Add the following and reduce your answers to lowest terms.

$$\begin{array}{r} 4\frac{5}{8} \\ 11\frac{7}{16} \\ +13\frac{1}{2} \\ \hline \end{array} \qquad \begin{array}{r} 2\frac{1}{2} \\ 3\frac{3}{5} \\ +4\frac{4}{15} \\ \hline \end{array} \qquad \begin{array}{r} 13\frac{1}{2} \\ 10\frac{1}{3} \\ +5\frac{1}{4} \\ \hline \end{array} \qquad \begin{array}{r} 7\frac{5}{6} \\ 3\frac{1}{3} \\ +8\frac{3}{4} \\ \hline \end{array}$$

$$\begin{array}{r} 3\frac{1}{4} \\ +1\frac{7}{10} \\ \hline \end{array} \qquad \begin{array}{r} 83\frac{5}{6} \\ +29\frac{7}{8} \\ \hline \end{array} \qquad \begin{array}{r} 65\frac{1}{5} \\ +33\frac{1}{3} \\ \hline \end{array} \qquad \begin{array}{r} 5\frac{1}{3} \\ +6\frac{2}{9} \\ \hline \end{array}$$

SUBTRACTING UNLIKE MIXED NUMBERS

To subtract mixed numbers with different denominators, follow these steps:

Step 1	Find a common denominator.
Step 2	Subtract the fractions, renaming when necessary.
Step 3	Subtract the whole numbers.
Step 4	Write the difference in lowest terms.

Example A

$$\begin{array}{rcr} 15\frac{7}{10} & = & 15\frac{21}{30} \\ -\ 8\frac{8}{15} & = & 8\frac{16}{30} \\ \hline \end{array}$$

$$7\frac{5}{30} = 7\frac{1}{6}$$

Subtract the following and reduce your answers to lowest terms.

$$\begin{array}{r} 12\frac{3}{7} \\ -\ 4\frac{2}{3} \\ \hline \end{array} \qquad \begin{array}{r} 12\frac{5}{16} \\ -\ 7\frac{1}{2} \\ \hline \end{array} \qquad \begin{array}{r} 18\frac{3}{10} \\ -\ 13\frac{3}{4} \\ \hline \end{array} \qquad \begin{array}{r} 4\frac{1}{8} \\ -\ 1\frac{3}{6} \\ \hline \end{array}$$

$$\begin{array}{r} 15\frac{8}{15} \\ -\ 8\frac{7}{10} \\ \hline \end{array} \qquad \begin{array}{r} 7\frac{1}{6} \\ -\ 2\frac{3}{4} \\ \hline \end{array} \qquad \begin{array}{r} 5\frac{3}{8} \\ -\ 1\frac{7}{12} \\ \hline \end{array} \qquad \begin{array}{r} 7\frac{7}{12} \\ -3\frac{1}{8} \\ \hline \end{array}$$

MULTIPLICATION

× ÷

DIVISION

MULTIPLYING FRACTIONS

Unlike adding and subtracting fractions, *there is no need for common denominators when you multiply and divide*. In some cases, you will just multiply straight across, multiplying numerator by numerator and denominator by denominator.

Example 1: $\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$

Other problems can be solved more easily by ***canceling***--reducing a numerator and a denominator divisible by the same factor.

Example 2 $\frac{6}{15} \times \frac{5}{12}$

Step 1 The 15 and the 5 can be divided by 5.

$$\frac{6}{\underset{3}{\cancel{15}}} \times \frac{\overset{1}{\cancel{5}}}{12}$$

Step 2 The 6 and the 12 can be divided by 6.

$$\frac{\overset{1}{\cancel{6}}}{\underset{3}{\cancel{15}}} \times \frac{\overset{1}{\cancel{5}}}{\underset{2}{\cancel{12}}}$$

Step 3 Multiply straight across.

If necessary, reduce the answer.

$$\frac{1}{3} \times \frac{1}{2} = \boxed{\frac{1}{6}}$$

TO MULTIPLY FRACTIONS

1. Reduce numerators and denominators by canceling.
2. Multiply straight across.
3. Be sure your answer is reduced to lowest terms.

To multiply by a fraction is to find a part of something.

Adapted from Contemporary Books, Number Power Review, 1991.

You can also cancel with three fractions. Sometimes you have to "jump" over the middle number.

Example 3 $\frac{3}{8} \times \frac{4}{7} \times \frac{5}{9}$

Step 1 Divide both the 3 and 9 by 3.

$$\frac{\overset{1}{\cancel{3}}}{8} \times \frac{4}{7} \times \frac{5}{\underset{3}{\cancel{9}}}$$

Step 2 Divide both the 4 and 8 by 4.

$$\frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{8}}} \times \frac{\overset{1}{\cancel{4}}}{7} \times \frac{5}{\underset{3}{\cancel{9}}}$$

Step 3 Multiply straight across.

$$\frac{1}{2} \times \frac{1}{7} \times \frac{5}{3} = \boxed{\frac{5}{42}}$$

TO MULTIPLY MIXED NUMBERS

1. Change mixed numbers to improper fractions.
2. Reduce numbers divisible by the same number by canceling.
3. Multiply straight across.
4. Be sure your answer is reduced to lowest terms.

Example 4 below shows a case that involves multiplying mixed numbers.

Example 4

Step 1 Change all mixed numbers to improper fractions.

$$2\frac{1}{3} \times 3\frac{1}{2} = \frac{7}{3} \times \frac{7}{2}$$

Step 2 Multiply. If the answer is an improper fraction, change it to a whole or mixed number.

$$\frac{7}{3} \times \frac{7}{2} = \frac{49}{6} = 8\frac{1}{6}$$

Tip: Sometimes you may have to multiply a whole number by a fraction or a mixed number. Rewrite the whole number over 1 and then multiply as usual.

MULTIPLYING FRACTIONS

$\frac{6}{15} \times \frac{5}{12}$

$8 \times \frac{3}{4}$

$\frac{3}{8} \times \frac{2}{15} \times \frac{6}{7}$

$8\frac{1}{6} \times 4$

$\frac{5}{9} \times \frac{2}{5}$

$2\frac{1}{2} \times 2\frac{1}{3}$

$2\frac{3}{4} \times \frac{6}{7}$

$1\frac{3}{10} \times 5$

$3\frac{3}{8} \times 1\frac{3}{9} \times \frac{2}{3}$

Dividing Fractions by Fractions

To divide a fraction by a fraction, multiply the first fraction by the reciprocal of the second fraction. To find the reciprocal, invert the fraction (turn it upside down).

Write the reciprocals: $\frac{1}{2}, \frac{3}{4}$

Number	Reciprocal
$\frac{1}{2}$	$\frac{2}{1}$
$\frac{3}{4}$	$\frac{4}{3}$

Find: $\frac{3}{4} \div \frac{1}{4}$

Invert the second fraction and multiply.

$$\frac{3}{4} \div \frac{1}{4} = \frac{3}{4} \text{ X } \frac{4}{1} = \frac{3}{1} = 3$$

Write the reciprocals by inverting the fractions.

$\frac{1}{6}$ ______________ $\frac{2}{3}$ ______________ $\frac{1}{20}$ ______________

$\frac{6}{8}$ ______________ $\frac{4}{9}$ ______________ $\frac{25}{50}$ ______________

Divide.

$\frac{2}{9} \div \frac{3}{4} =$ ______ $\frac{5}{12} \div \frac{3}{4} =$ ______ $\frac{9}{16} \div \frac{3}{8} =$ ______

$\frac{3}{16} \div \frac{9}{32} =$ ______ $\frac{5}{16} \div \frac{5}{32} =$ ______ $\frac{10}{64} \div \frac{1}{4} =$ ______

Dividing Fractions by Mixed Numbers and Whole Numbers

To divide a fraction by a mixed or whole number, change the mixed or whole number to an improper fraction. Invert and multiply.

Find: $\frac{3}{4} \div 3$

Find: $\frac{9}{10} \div 3$

Change 3 to $\frac{3}{1}$. Invert and multiply.

$$\frac{3}{4} \div 3 = \frac{3}{4} \div \frac{3}{1} = \frac{\overset{1}{\cancel{3}}}{4} \times \frac{1}{\underset{1}{\cancel{3}}} = \frac{1}{4}$$

Change $1\frac{1}{2}$ to $\frac{5}{2}$. Invert and multiply. Simplify.

$$\frac{9}{10} \div 1\frac{1}{2} = \frac{9}{10} \div \frac{3}{2} = \frac{\overset{3}{\cancel{9}}}{\underset{5}{\cancel{10}}} \times \frac{\overset{1}{\cancel{2}}}{\underset{1}{\cancel{3}}} = \frac{3}{5}$$

Divide.

$\frac{6}{7} \div 6 =$ ________

$\frac{7}{10} \div 3\frac{1}{2} =$ ________

$\frac{4}{5} \div 2 =$ ________

$\frac{3}{4} \div 1\frac{1}{2} =$ ________

$\frac{5}{6} \div 2\frac{1}{2} =$ ________

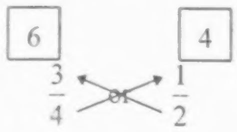
$\frac{2}{3} \div 2 =$ ________

$\frac{4}{9} \div 1\frac{1}{4} =$ ________

$\frac{5}{6}$

Compare Fractions by Cross Multiplying Up

To compare two fractions by cross multiplying up, multiply the denominators of the fractions by the opposite numerators. The fraction with the highest total is the largest fraction. In the illustration below $\frac{3}{4}$ is compared to $\frac{1}{2}$. The 2 is multiplied by the 3 and the answer is put over $\frac{3}{4}$. Then the 4 is multiplied by 1 and the answer put over $\frac{1}{2}$. The fraction with the highest number above it is the largest.



Compare the size of the following pairs of fractions by cross multiplying up. Write your answers in the spaces provided. Use the signs >, <, or =.

REMEMBER: The arrow always points to the smaller number.

- 15 > 8

  $\frac{3}{4}$ or $\frac{2}{5}$

1. ____ ____ ____

   $\frac{3}{8}$ or $\frac{1}{2}$

2. ____ ____ ____

   $\frac{10}{12}$ or $\frac{6}{8}$

3. ____ ____ ____

   $\frac{6}{8}$ or $\frac{4}{5}$

4. ____ ____ ____

   $\frac{1}{4}$ or $\frac{1}{3}$

5. ____ ____ ____

   $\frac{5}{7}$ or $\frac{7}{10}$

6. ____ ____ ____

   $\frac{3}{8}$ or $\frac{9}{24}$

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WORKSHEET

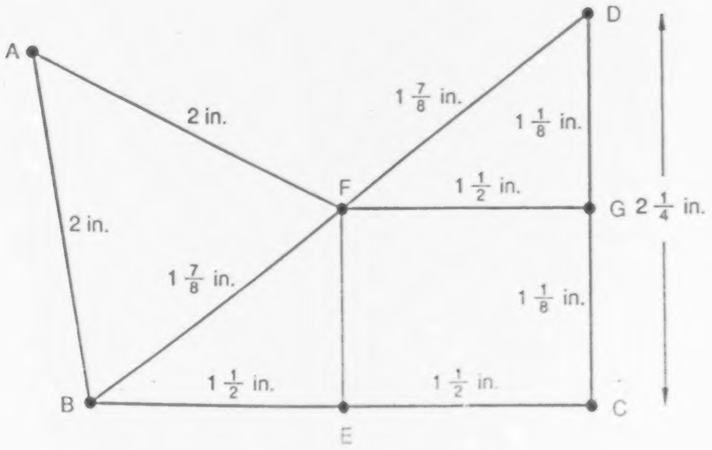
1. Larry has a pallet of shelves 13 feet long. He wants to cut the shelves to make 4 smaller shelves of equal length. How many smaller shelves can he cut if he has 3 boxes of shelves? Express your answer as a whole or mixed number.

2. Kathy's department uses some boxes with a $\frac{3}{8}$ inch long tab on the end and some boxes with a $\frac{3}{4}$ inch tab. Kathy's supervisor asks her to order 50 boxes of the larger tabs. Which ones are the largest?

3. Find the missing length (l) in the drawing below.

4. A piece of metal 438 inches long is cut into 4 equal pieces. How long is each piece?

Use the drawing below to answer the following questions.



1. How many inches is the distance from A to B to C?

2. Suppose you divided the line between D and F into 3 equal pieces. How long would each piece be?

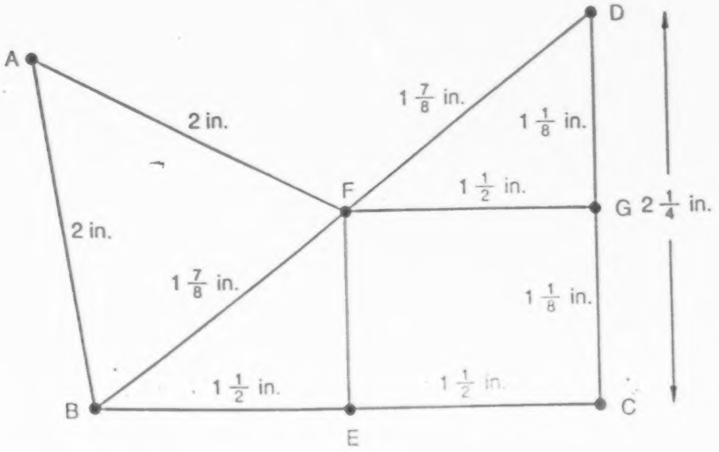
3. What is $\frac{1}{3}$ of the distance from D to C?

4. How much longer is the distance from C to D than the distance from A to F?

5. The **perimeter** of a figure is the measurement of the distance around that figure. What is the perimeter of triangle ABF?

6. The **area** of a rectangle is found by multiplying its length by its width. What is the area of rectangle FGCE?

Use the drawing below to answer the following questions.



1. How many inches is the distance from A to B to C? **5 inches**

2. Suppose you divided the line between D and F into 3 equal pieces. How long would each piece be? **$\frac{5}{8}$ inches**

3. What is $\frac{1}{3}$ of the distance from D to C? $\frac{3}{4}$ inch

4. How much longer is the distance from C to D than the distance from A to F? **$\frac{1}{4}$ inch**

5. The **perimeter** of a figure is the measurement of the distance around that figure. What is the perimeter of triangle ABF? $5\frac{7}{8}$ **inches**

6. The **area of a rectangle** is found by multiplying its length by its width. What is the area of rectangle FGCE? $1\frac{11}{16}$ **inches**

TAPE MEASURE
&
FRACTION APPLICATIONS

DIVISION

MULTIPLICATION

SUBTRACTION

ADDITION

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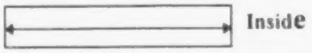
KEY WORDS

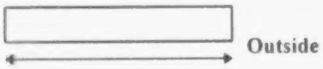
Calibrate – To check, adjust, or standardize systematically the graduations of a measuring instrument.

Increment – The amount or degree by which something changes.

Inside measurement – The inside dimension of two parallel sides.



Outside measurement – The outside dimension of two parallel sides.



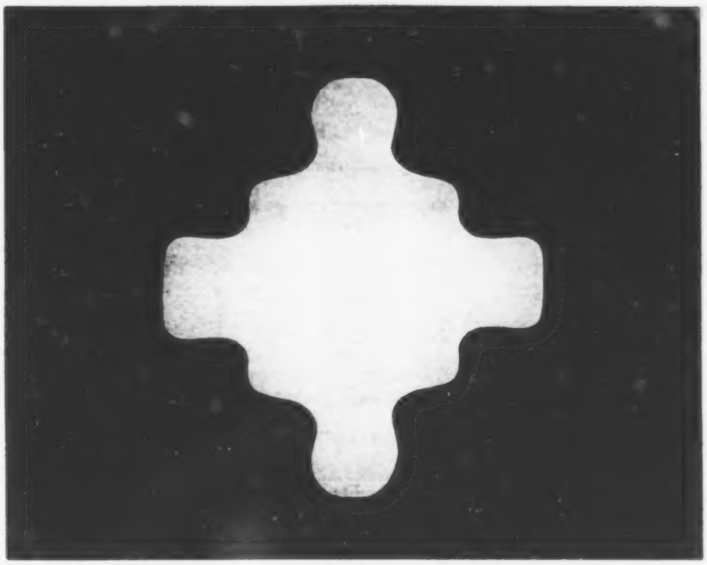
Parallel lines – Lines that are always equally distant from each other.

Riveted – Secured by a metal pin (or rivet).

Tolerance – The amount of variation from the desired or specified size that is permitted.

Tape Measure – A narrow strip of steel tape marked off in units for measuring.

Attachment B



Just as all pieces of a puzzle must fit together, the products we manufacture and sell at Lozier to our customers must also fit. The measurement of our product is a very vital part of this puzzle. Each piece must be measured accurately in order to fit. If a customer orders uprites for 24 inch shelves and receives 22 inch shelves, the shelves will not fit. The product is often returned at our expense, or we must expedite the right product to them, sometimes disrupting our regularly scheduled product. One can see what an impact accurate measurement and packaging have on our product. Even though your job may be attaching channels to storage shelves or packing the same product all day, your job and/or function is a very important part of this puzzle.

TAPE MEASURE

Do not attempt to tighten the hook at the end of your tape measure. It's a precisely calibrated part of the function of the tape measure!

Using the Hook

Have you noticed that the hook on the end of a tape measure is loose? The hook is loosely riveted to the metal tape through slotted holes that allows it to move back and forth. This was designed to allow an accurate "zero" setting for both inside and outside measurements.

Example:
When measuring a 24-inch shelf, you would place the hook on the end of the shelf and *pull* the tape. This "stretches" the hook out, leaving the *inside* of the hook even with the end of the shelf and with "zero" on your tape measure. However, suppose you needed to measure a wall where the shelf will be installed. You would *push* the tape which "squeezes" the hook so its *outside* is even with the wall and with "zero".

Using the case

The length of its case is marked on the side of every tape measure. A typical statement is: "Add 2 in. to inside measurements". Some tapes will indicate the size between two dimension arrows (←——2 in. ——→).

The case of a tape measure is also used to take an inside measurement. Suppose you needed to measure the width of the upstairs walkway leading to the training rooms. You would place the hook on the outer edge of the walkway and *pull* the tape. The case would be placed against the wall. You would add the measurement of the case to the last number on your tape.

Helpful Hint: ***Tape cases are 2, 2¼, 3¼, 3½, or 4 inches in length. When purchasing a tape, look for one with a 2, 3, or 4-inch case. This eliminates adding fractions when taking inside measurements!***

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Locks

On some tape measures, you must manually apply the lock or brake either by moving a slide or pushing a button located on the case. To release, you push the button or move the slide in the opposite direction.

Another type of tape measure locks when you stop pulling the tape out of the case. The bottom of the case is a lever which you press to release the tape. The tape rewinds when you press the release lever.

Special Markings

Tool companies try to make their tape measures as easy as possible to use. One way they do this is to highlight key dimensions. Usually, there is a special mark at each foot, such as a different color numeral, or a box around the number. Standard locations for building studs (the uprights used in building a wall) are also highlighted. Some tape measures are marked in *feet and inches* as well as *inches*. (Example: 48 inches will be marked 48" as well as 4 ft.)

NOTE:
Tape measures issued at Lozier measure in 32nd increments and must be checked for accuracy periodically by the quality departments.

CARE OF TAPE MEASURE

RULE 1: Take care to see that your tape measure isn't stepped on.
More tape measures are ruined by being stepped on than any other cause.

RULE 2: Keep the tape clean.
Try to avoid getting sand, dirt, grease or moisture on your tape.

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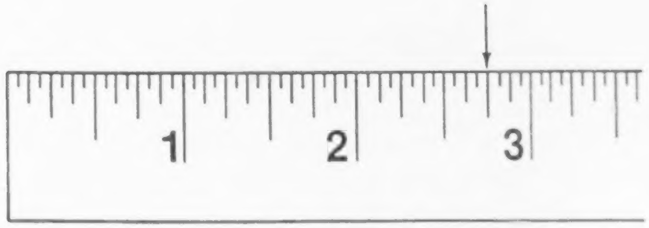
Did you know???

One sixteenth of an inch is about the thickness of a penny.

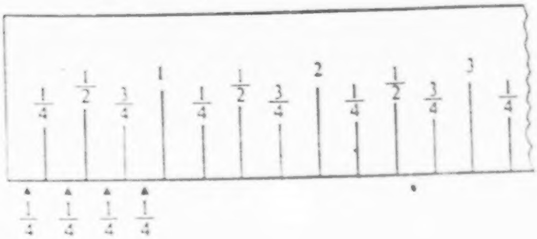
One eighth of an inch is approximately the thickness of two pennies.



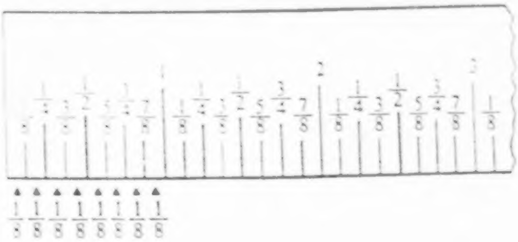
The arrow points to $2\frac{3}{4}$ inches. This is the same as $2\frac{6}{8}$ inches and the same as $2\frac{12}{16}$ inches. The first reading is preferred.

Reading A Tape Measure

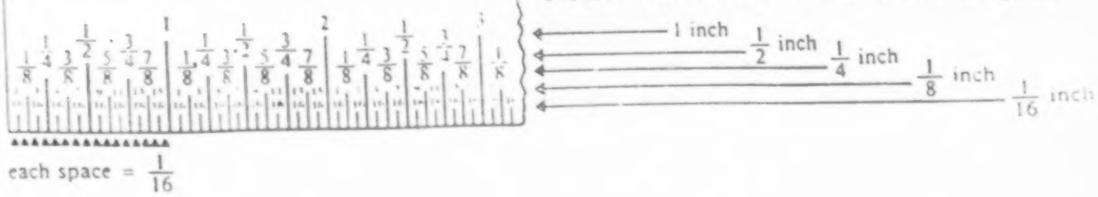
A. If each inch is divided into 4 spaces, each space is $\frac{1}{4}$ inch.



B. If each inch is divided into 8 spaces, each space is $\frac{1}{8}$ inch.



C. If each inch is divided into 16 spaces, each space is $\frac{1}{16}$ inch.



Notice the lines are of different heights.

Source: Essential Mathematics for Life, Four Edition, Glencoe/McGraw-Hill, New York, NY, 1995.

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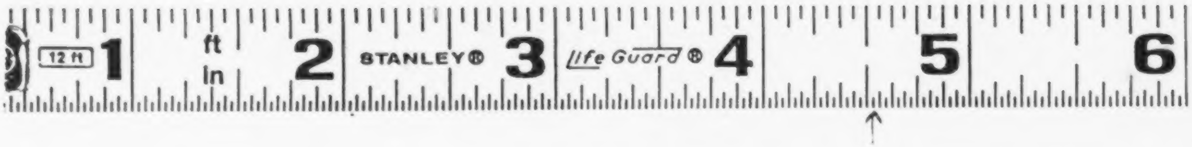
Attachment D
Page 3 of 3

Linear Measurement

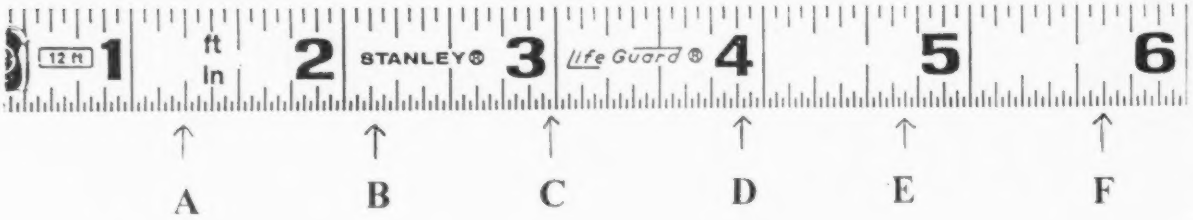


To what increment is the arrow pointing ________________.

Helpful Hint:

Locate $4\frac{1}{2}$ (Remember $4\frac{1}{2} = 4\frac{16}{32}$)

Add one more increment. Answer: $4\frac{17}{32}$



To what increments are the arrows pointing?

A. ________________

B. ________________

C. ________________

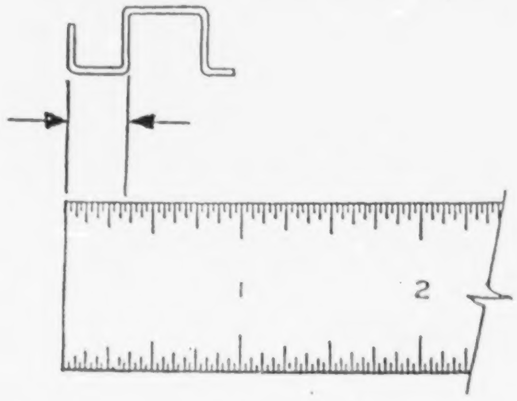
D. ________________

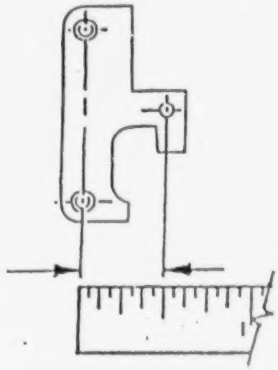
E. ________________

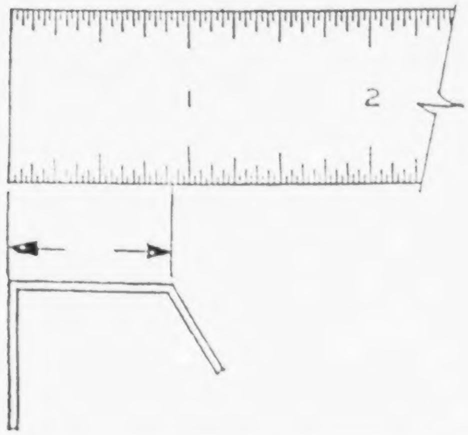
F. ________________

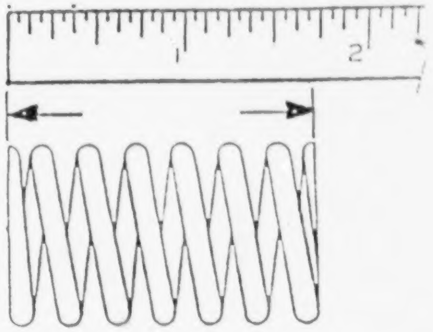
WORKSHEET

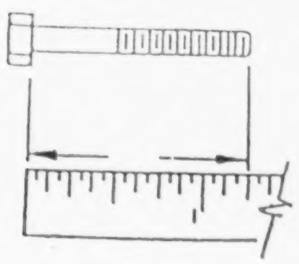
Read each measurement between arrows and record answers on line provided below each diagram. Reduce answers to the lowest terms.

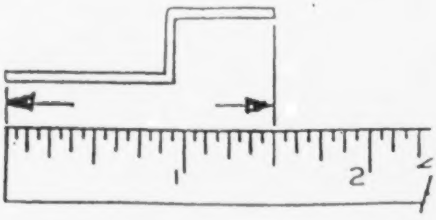












Read the following and solve the problems. Reduce fractions to the lowest terms.

1. Scottsboro Alabama, received 1¼ inches of snow on Thursday, 1½ inches on Friday, and 3½ inches on Saturday. What was the total amount of snow that fell in the 3 day period? ____________

   How much more snow fell on Saturday than on Thursday? ____________

2. Sixteen employees on second shift are enrolled in a training class. On Tuesday afternoon, $\frac{1}{8}$ of the employees were not in class. How many people were in class on Tuesday afternoon? ____________

3. If the dimension of a product on a blueprint is $3\frac{1}{2}$ and the actual measurement of the product is $3\frac{7}{16}$, what is the difference in the two measurements? ____________

   If the tolerance for the product is $\pm\frac{1}{32}$, is the measurement within tolerance? ____________

4. If the dimension of a product on a blueprint is $4\frac{13}{16}$ and the actual measurement of the product is $4\frac{3}{4}$, what is the difference in the two measurements? ____________

If the standard tolerance is $\pm\frac{1}{32}$, is the measurement within tolerance? ________________

5. A paintline employee checking the tolerance of a shelf found that the shelf measured $47\frac{15}{16}$ inches long. If the standard tolerance is $\pm\frac{1}{32}$, is the shelf acceptable as a 48-inch shelf?

____

Approximately how many feet long is the shelf?

____

Check the tolerances. Use the standard tolerance of $\pm\frac{1}{32}$.

Print Dimension	Minimum Tolerance	Maximum Tolerance	Actual Measure	Is Measure within Tolerance?
1. $5\frac{9}{16}$			$5\frac{19}{32}$	
2. $1\frac{3}{4}$			$1\frac{11}{16}$	
3. $9\frac{7}{8}$			$9\frac{3}{4}$	
4. $17\frac{23}{32}$			$17\frac{21}{32}$	
5. $4\frac{15}{16}$			$4\frac{31}{32}$	
6. $3\frac{1}{2}$			$3\frac{9}{16}$	
7. 2 3/[illegible]			$2\frac{1}{2}$	
8. $6\frac{5}{16}$			$6\frac{4}{16}$	
9. $1\frac{5}{32}$			$1\frac{1}{8}$	
10. $2\frac{17}{32}$			$2\frac{1}{2}$	
11. $3\frac{1}{2}$			$3\frac{7}{16}$	
12. $2\frac{5}{8}$			$2\frac{14}{16}$	
13. $4\frac{7}{16}$			$4\frac{1}{2}$	
14. $1\frac{3}{32}$			$1\frac{1}{8}$	

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Print Dimension	Minimum Tolerance	Maximum Tolerance	Actual Measure	Is Measure within Tolerance?
15. $5\frac{1}{4}$			$5\frac{8}{32}$	
16. $6\frac{1}{8}$			$6\frac{5}{32}$	
17. $3\frac{3}{8}$			$3\frac{6}{16}$	
18. $4\frac{13}{16}$			$4\frac{3}{4}$	
19. $5\frac{29}{32}$			$5\frac{7}{8}$	
20. $1\frac{5}{32}$			$1\frac{1}{8}$	

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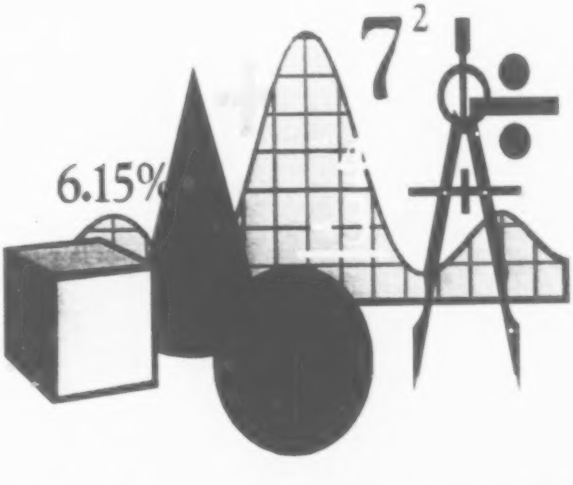
INTRODUCTION TO PRECISION MEASURING INSTRUMENTS



Module: **Introduction to Precision Measuring Instruments** **Overall Time 60 min.**
Job Title: New Hires/General **Page 1 of 1**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners will recognize various measuring instruments and measure several parts using these instruments with 100% accuracy.	**Motivational Activity:**. Brown bag containing various instruments and bottle of soft drink will be displayed on the table. Instructor will remove utensils one at a time discussing how each might be used.	5 min	Brown paper bag filled with screw driver, bottle opener, pizza cutter, etc. and a bottle of soft drink.	Discussion
	Vocabulary: Instructor will display vocabulary words on an overhead and discuss meanings (Attach. A).	10 min	Overhead projector, Attachment A	Discussion
	Instructional Activity: Instructor will lead discussion on use and care of measuring instruments. Instructor will explain reading decimals and converting decimals to fractions	15 min	Attachments. B, C, D, caliper, micrometer, and protractor	
	Guided Practice: Instructor will assist learners in measuring several different Lozier parts (Attach. E).	10 min	Attach. E, calipers, micrometers, and protractors	Observation
	Independent Practice: Complete crossword puzzle (Attach. F).		Attach. F	Check for accuracy
	Evaluation: Discuss answers recorded when measuring items.			Check for accuracy

LOZIER CORPORATION

Job Title: New Hires/General

Module: Introduction to Precision Measuring Instruments.

General Instructional Objective: Learners will identify and recognize the proper use and care of various measuring instruments.

Specific Instructional Objective: Learners will recognize precision measuring instruments (caliper, micrometer, and protractor) and measure several parts using these instruments with 100% accuracy.

Motivational Activity: A brown bag containing various instruments (screw driver, vegetable peeler, bottle opener, pizza cutter, etc.) and an unopened bottle of soft drink will be displayed on the table. Instructor will remove utensils one at a time discussing how each might be used. Ask could it be used to open the soft drink bottle. Remove bottle opener last and relate the fact that all the utensils are useful but only the bottle opener would be effective in opening the soft drink bottle. Instructor will lead discussion on the necessity of using the proper measurement tools at work.

Vocabulary: The instructor will display vocabulary words on an overhead (Attachment A). Define each word and give an example of the vocabulary word if applicable. Teacher may chose to use flip chart to record responses.

Instructional Activity: Instructor will demonstrate the correct usage of a caliper, micrometer, and protractor(Attachment B). Instructor will reinforce the proper procedures necessary in handling and maintaining measurement tools (Attach. C). Instructor will review decimals, making sure learners understand place value (Attach. D).

Guided Practice: Instructor will assist learners in completing worksheet on decimals (Attachment D). Instructor will assist learners in measuring several different Lozier parts. Learners will accurately record their measurements on the answer sheet provided (Attachment E).

Independent Practice: Using a caliper, micrometer, and protractor, learners will measure several Lozier items independently. Learners will complete crossword puzzle (Attachment F).

Closure/Evaluation: Discuss answers recorded when measuring displayed items and reinforce importance of accurate measurement. If answers vary, measure items again for accuracy.

Attachment A

KEY WORDS

Accuracy – the state of being exact.

Angle – two straight lines that meet at a point (the symbol for angle is ∠).

Caliper – instrument used to verify product dimensions (inside and outside).

Degrees – divisions or intervals marked on a scale of a measuring instrument (the symbol for degree is °).

Dimensions – any measurable extent, length, width, thickness, etc.

Increment – amount or degree by which something changes.

Measurement – a unit or standard for determining extent, volume, or quantity.

Micrometer – precision instrument used to measure small distances and angles.

Precision – to be accurate or exact.

Protractor – instrument used to measure or lay out angles on drawings.

Tolerance – the allowable deviation or change from a standard

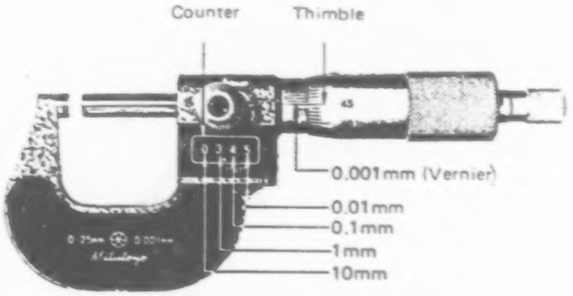
Introduction to Measuring Instruments

To insure quality, some measurements must be very precise. These measurements require a tool more precise than a tape measure.

The greater the degree of precision required, the more precise measuring instruments must be used. The three precision measuring instruments commonly used at Lozier are the caliper, micrometer, and protractor. Measurements taken with these instruments are generally expressed as decimals.

Micrometer

The micrometer is used to measure items requiring accuracy to the "one thousandth" and at Lozier the readings are in decimals.



Micrometers are used at Lozier to measure the gauge of steel. This takes place most often in the coil line and brackets area. The micrometers are provided by the quality department and are located at a station in the department where they are used.

Caliper

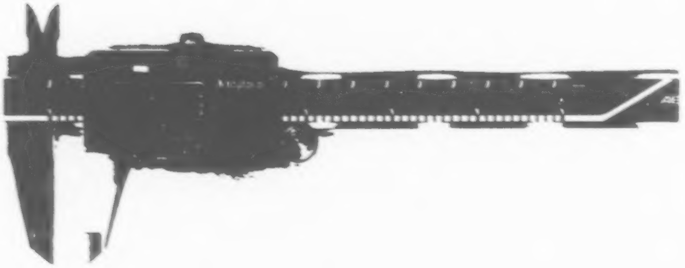
The caliper is a device used for contact measurement. It consists of two movable metal legs. There are outside, inside, and combination instruments that measure inside and/or outside dimensions.

- Outside calipers have inward-pointing contacts and are designed to close around the outside of the piece to be measured.

- Inside calipers, used to measure the inside of an enclosed space, have legs that point out.

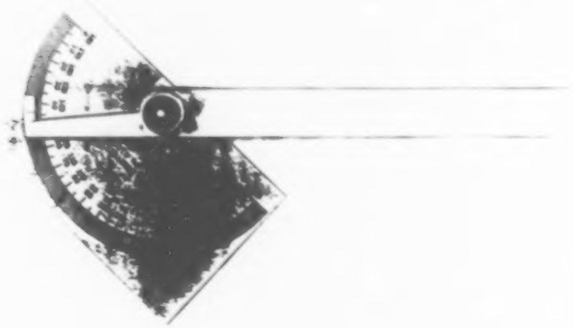
- Combination tools have two sets of contact legs.

Lozier generally uses 6 inch calipers. A few 12 inch calipers are available in the Quality Department. Calipers are available at stations located on the plant floor mainly in the metals department. Calipers are used to verify the length and width of Lozier parts (especially brackets and shelving).



Protractor

Protractors are used to measure angles. Lozier uses beveled protractors. These can measure an angle from 0° to 180°. Employees use this protractor to measure the angles of tag molding on Lozier shelving. Tag molding has specific angle regulations dictated by the Americans with Disabilities Act (ADA) and our customers. Protractors are available at stations in the department they are used or in the Quality Lab.



Guidelines for Handling Measurement Tools

Before measuring an item, be certain to "zero out" the precision instrument. Refer to the specific instructions from your instrument manufacturer to zero the read-out.

- It is critical to check the calibration date before using.
- It is critical to check the tool for damage before using.
- Do not toss or throw any precision measurement tool.
- Clean the tool with a soft cloth after each use.
- Always store the tool in it's case when not in use to protect it from dirt and other hazards.
- For care and accuracy, always use two hands when handling precision instruments.
- Never place precision instruments on running machines.
- Remember to return tools to their station. Other people will be using the same tools.

Key Points of Precision Measurements

- All measuring tools must be used accurately.
- Measurement tools must be calibrated periodically.
- Quality Department is responsible for calibrating instruments, but all operators must check calibration expiration dates.
- If a tool "seems off", have it checked, regardless of calibration date.

Place Value

Most of us use decimals on a daily basis. In our money system, a decimal point separates dollars from cents. Numbers after the decimal point represent a value ***less than one dollar***.

Example: $1.00 $.50 (less than one dollar)
← →

Our number system uses the decimal point to separate ***whole numbers*** from numbers with a value ***less than 1.***

The number of digits following the decimal point tell you how small the decimal value is.

Look at the **place value chart** below. (Notice the words to the right of the decimal point end in ***ths*****).**

9	,	3	5	4	.	2	3	7
thousands		hundreds	tens	ones		tenths	hundredths	thousandths

What place is the 4 in? ________ What place is the 3 in? ________

Decimal values can go much further than the thousandths place, however, in most cases you will not need to use values less than a thousandth.

Your answers to the above questions were correct if you said the 4 is in the ***ones*** *place and the 3 is in the* ***hundredths*** *place!*

Source: Frenchette, Ellen Carley, Math Solutions - Decimals, Fractions, Ratios, and Percents. New Readers Press, Syracuse, N.Y., 1995.

Reading Decimals

To read a decimal number, use your knowledge of place values.

Reading a Decimal:

Example: How would you read the number **.685**?

Step 1 Read the number just as you would read a whole number.	*Six hundred eighty-five*
Step 2 Read the place value of the *last* digit on the right.	The last digit in the number is a 5. It is in the *thousandths* place.

The number is read as **"six hundred eighty-five thousandths."**

Use the place value chart to fill in the blanks below.

In the number 7,890.254, what digit is in the following places:

a. tens place? _____
b. tenths place? _____
c. hundredths place? _____
d. ones place? _____

In the number 4,056.29, what digit is in the following places:

a. tens place? ______
b. tenths place? ______
c. hundredths place? ______
d. ones place? ______

Have you ever thought of money as decimals? For example, $.01 is a penny, and $.10 is a dime, $1.00 is a dollar. Place value is very important!

Source: Frenchette, Ellen Carley, Math Solutions - Decimals, Fractions, Ratios, and Percents, New Readers Press, Syracuse, N.Y., 1995.

Converting Fractions to Decimals

Fractions and decimals both show part of a whole. To write a decimal as a fraction, put the ***part*** over the ***whole***.

Example: What fraction of a dollar is 25¢?
Look at the place value of the decimal. \$.2 5 is twenty-five ***hundredths***.

tenths
hundredths

Therefore, $.25 = \dfrac{25}{100}$ $\begin{matrix}\text{Parts}\\ \text{Total parts}\end{matrix}$

Try writing these decimals as fractions. ***Remember — The decimal's place value is the fraction's denominator.***

.1	.10	.5	.750	.85
____	____	____	____	____

At times you may need to work with decimals instead of fractions. To convert a fraction to a decimal, divide the numerator by the denominator.

Example: $\mathbf{1/8 = 8\overline{)1.00}}$

Try writing these fractions as decimals.

$^{3}/_{4}$	$^{1}/_{2}$	$^{1}/_{4}$
____	____	____

Equivalencies

Decimals, Fractions, Percents

Decimal	Fraction	Percent
.1	$\frac{1}{10}$	10%
.2	$\frac{1}{5}$	20%
.25	$\frac{1}{4}$	25%
.3	$\frac{3}{10}$	30%
.333 or $.33\frac{1}{3}$	$\frac{1}{3}$	$33\frac{1}{3}$ %
.4	$\frac{2}{5}$	40%
.5	$\frac{1}{2}$	50%
.6	$\frac{3}{5}$	60%
.666 or $.66\frac{2}{3}$	$\frac{2}{3}$	$66\frac{2}{3}$ %
.7	$\frac{7}{10}$	70%
.75	$\frac{3}{4}$	75%
.8	$\frac{4}{5}$	80%
.9	$\frac{9}{10}$	90%
1.0	$\frac{10}{10}$	100%

Attachment E

MEASUREMENT ANSWER SHEET

Directions: Measure the displayed Lozier parts with the proper measuring tool and record your answers below. Use the chart on qualified measuring equipment at the bottom of the page to identify which tool to use.

1. ________________________

2. ________________________

3. ________________________

4. ________________________

5. ________________________

6. ________________________

7. ________________________

8. ________________________

9. ________________________

10. ________________________

11. ________________________

12. ________________________

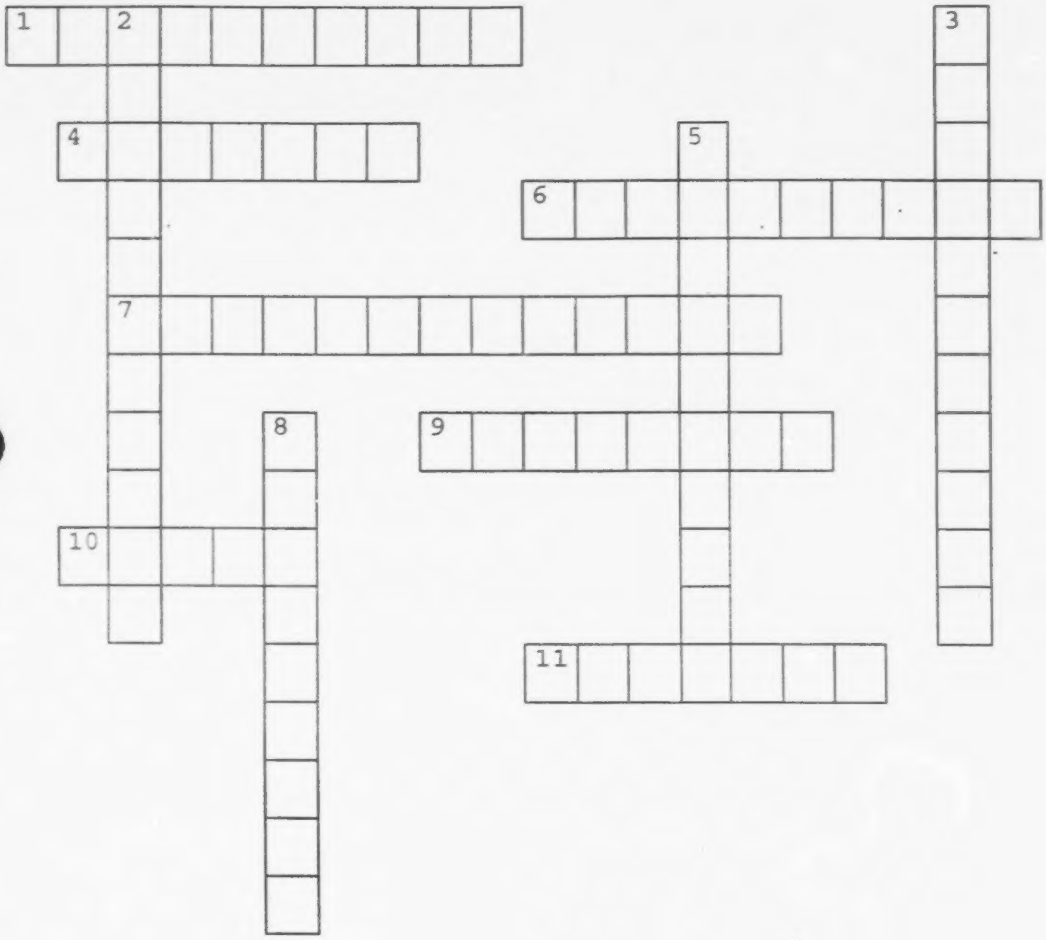
QUALIFIED MEASURING EQUIPMENT

DIMENSIONAL REQUIREMENTS	MEASUREMENT EQUIPMENT
.001" TO .015"	Calipers (all sizes) Micrometers (all sizes) Depth Gages Coordinate Measuring Machines
.015" TO .031"	Combination Squares Steel Rules
.031" AND OVER	Tape Measures
.5 AND OVER	Protractor

Attachment F

Crossword Puzzle

Directions: Using the clues provided, work the crossword puzzle.



ACROSS

. Any measurable extent, length, width, thickness, etc.
4. Instrument used to verify product dimensions (inside and outside).
6. Precision instrument used to measure small distance and angles.
7. To do or make again.
9. The state of being exact.
10. Two straight lines that meet at a point.
11. One of the divisions or intervals marked on a scale of a measuring instrument.

DOWN

2. A unit or standard for determining extent, volume, or quantity.
3. A narrow strip of steel tape marked off in units for measuring. (two words)
5. Instrument used to measure or lay out angles on drawings.
8. To be accurate or exact.

Attachment F
Answer Sheet

1 D	I	2 M	E	N	S	I	O	N	S									3 T	
		E																A	
	4 C	A	L	I	P	E	R						5 P					P	
		S								6 M	I	C	R	O	M	E	T	E	R
		U											O					M	
		7 R	E	P	E	A	T	A	B	I	L	I	T	Y				E	
		E											R					A	
		M			8 P			9 A	C	C	U	R	A	C	Y			S	
		E			R								C					U	
	10 A	N	G	L	E								T					R	
		T			C								O					E	
					I					11 D	E	G	R	E	E	S			
					S														
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BLUEPRINTS

DRAFT

Module: **Blueprint** | **Overall Time 60 min.**
Job Title: **New Hires/General** | **Page 1 of 1**

Specific Instructional Objective	Learning Activities	Time	Resources/ Materials	Evaluation Process
Learners will identify specific areas and symbols on a blueprint with 100 % accuracy.	**Motivational Activity:**. Have learners list the directions for painting a wall. Discuss importance of including all necessary steps.	5 min	Dry erase board, markers	Participation
	Vocabulary: Discuss meaning of vocabulary words (Attachment A).	5 min	Overhead projector, transparency Attachment A	
	Instructional Activity: Teacher will lead discussion on reading blueprints (Attachment B).	10 min	Attachment B	Participation
	Guided Practice: Teacher will guide learners in locating information on blueprints (Attachment C).	10 min	Attachment C	Participation
	Independent Practice: Complete blueprint activity (Attachment D).	10 min	Attachment D	Participation
	Evaluation: Discuss completed activity.	5 min	Attachment D	Teacher observation

Attachment A

GLOSSARY

ANSI - Acronym for American National Standards Institute. Standard sizes were developed for blueprints so that they could be universally interpreted by any industry. The standards set uniform sizes and locations for information that describes the part.

Blueprint - A detailed drawing which provides information as to what the object will look like when it is complete.

Visualize - To get a mental picture of the shape and size of an object by looking at a blueprint or drawing.

Interpret - To look at a drawing and understand what you see on paper.

Detail Drawing - A drawing of a single part that provides all the information necessary in the production of that part.

Scale - The relationship of the size of the blueprint to the size of the actual object. Remember that the dimensions are always the exact size no matter what the scale.

Title (legend) - Name or description of a drawing.

Legend - The title or a brief description of a drawing. A special mark which appears on maps and drawings together with its definition.

Revision - Changes made in the print.

Notes - Notes on a blueprint that provide instructions and information that supplement the drawing.

Tolerance - The amount of variation, from the desired or specified size, that is permitted.

Linear Measurement - The measurement of distance between two points.

Horizontal - Parallel to or in the plane of the horizon.

Parallel - Being an equal distance apart at every point.

Vertical - Being at a right angle to the horizon.

BLUEPRINT:

A Reproduction of an original Engineering Drawing that is used by workers to manufacture something.

Information Found on a Blueprint

- Part to be manufactured, dimensions, and notes
- Material
- Title of the Drawing and Part
- Drawing number
- Manufacturer's name
- Tolerances
- Scale of the drawing
- Drafter and date (Designer, Engineer, Checker)
- Revision Information

Attachment B
Pages 1 of 2

THE LANGUAGE OF INDUSTRY AND SCIENCE, "BLUEPRINT DRAWINGS"

The language of industry and science is "drawings." The men and women of industry who build products should know how to read engineering drawings.

During the Civil War the manufacturing of guns became a problem. Few workers in factories could read or follow technical drawings. To remedy the problem, scale models of weapons to be manufactured were produced. These models were exact in detail, and workers then expanded and duplicated the model using the same materials. Can you imagine six or more men each working on a cannon with their calipers in hand, waiting their turn to get a measurement from one scale model? What if instrument clusters were manufactured this way?

In this lesson you will learn about some parts of a drawing and how to interpret them. Did you know the word "print" is the family name given to all copies made from an original engineering drawing? When referring to technical drawings, all phases of the drawing are shown.

It is easy to learn to read blueprint drawings, which today is the closest means to a universal form of communication known to man. Remember, to be an effective communicator is to tell someone something in a way he/she can understand it. Blueprints are made up of many different parts, each with a specific function. In the following pages we will examine the parts of a blueprint that you may encounter during a typical day in your department.

In today's world drawings are used in every industry. Whether it be the manufacturing of store fixtures, cars, clothing, steel, tires or houses, nearly everything is produced from a drawing. Learning to read drawings will help you to better understand and perform in the ever changing world of industry.

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Reading a Blueprint

Blueprint reading is the gathering of information from a blueprint. It involves two principle elements: visualization and interpretation.

Visualization is the ability to "see" or envision the size and shape of the object from a set of blueprints.

Another important aspect of blueprint reading is the ability to interpret lines, symbols, dimensions, notes and other information on the print.

Care of Blueprints

Blueprints and related specification sheets are as important as the tools you use. With proper care, blueprints can be kept usable for a long period of time.

Rules of Care You Should Observe

- Never write on a print unless you have been authorized to make changes.
- Keep prints clean and free of oil and dirt. Soiled prints are difficult to read and contribute to errors.

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TITLE BLOCKS

Title blocks are located on the lower right hand corner of the blueprint. The organization of this material may differ from print to print, but the following information will be consistently provided. Refer to the blueprint title block provided.

1. **Name** - Lozier Store Fixtures

2. The **drawing number** that is used to identify the blueprint. The drawing number will be located in three different areas on a blueprint.

DRAWING NO.
Examples:

DRAWING NO.
21055-01

DRAWING NO.
21328

3. The **title of the drawing** identifies the part or assembly and is followed by descriptive modifiers. The title is read by saying the modifiers' first. For example LEG, UPRITE, would be read UPRITE LEG.

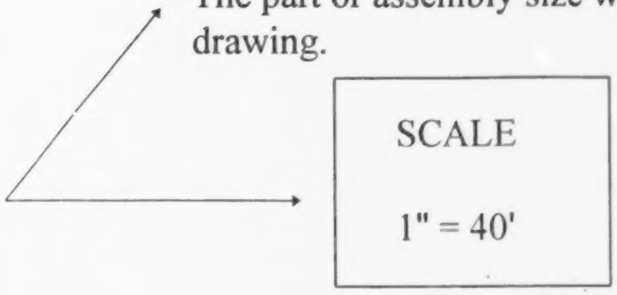
4. The **sheet number** is used when there is more than one sheet or page to the print.

1 of 1

PAGE 2 OF 3

5. The **drawing scale** of a title block is a comparison of the parts actual size verses the size of the drawing. Drawing scales may be written in Metric or English units of measurement.

The part or assembly size would be proportionate to the actual drawing.



Drawing Notes: The notes on a blueprint provide instructions and information that supplement the drawing.

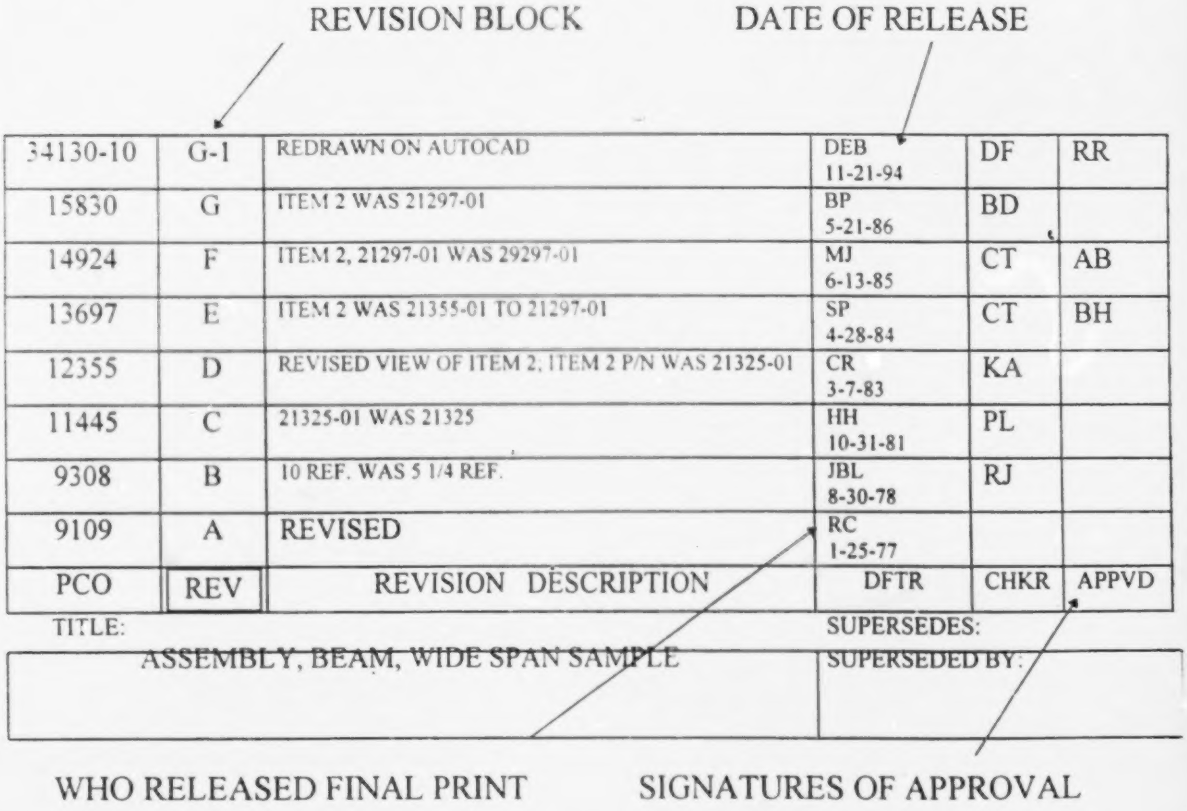
Example:

NOTES:

1. ASSEMBLY SHOWN IS LEFT HAND. EITHER RIGHT OR LEFT HAND MAY BY MADE FOR SAMPLE.
2. WIDESPAN BEAM CONNECTOR WELD SPECIFICATIONS:
    - NO WELD WIRE STICKS.
    - NO PITS.
    - NO SPATTER BEYOND 3/4" (3/8" OF WELD CENTERLINE).
    - 1/16" MAX. BURN THROUGH AT TOP & BOTTOM OF WELD.
    - NO WELD BUILD ABOVE HOOK FACE.
    - MIN. 1/4", MAX. 3/8" (5/16" ± 1/16") WELD WIDTH.
    - NO PUDDLE APPEARANCE.
    - NO ROPING.
    - WELD LENGTH - MAX. VARIABILITY 1/8" EACH END OF BEAM CONNECTOR.

Revision block: The revision block indicates any changes that have been made to the original blueprint drawing. The revision level will be located in three different areas on the blueprint. All three revisions should match.

The **signatures of approval** by those who are responsible for certain phases of the drawing or production of the part are shown. Also the **date of release** and **who released the final print**.

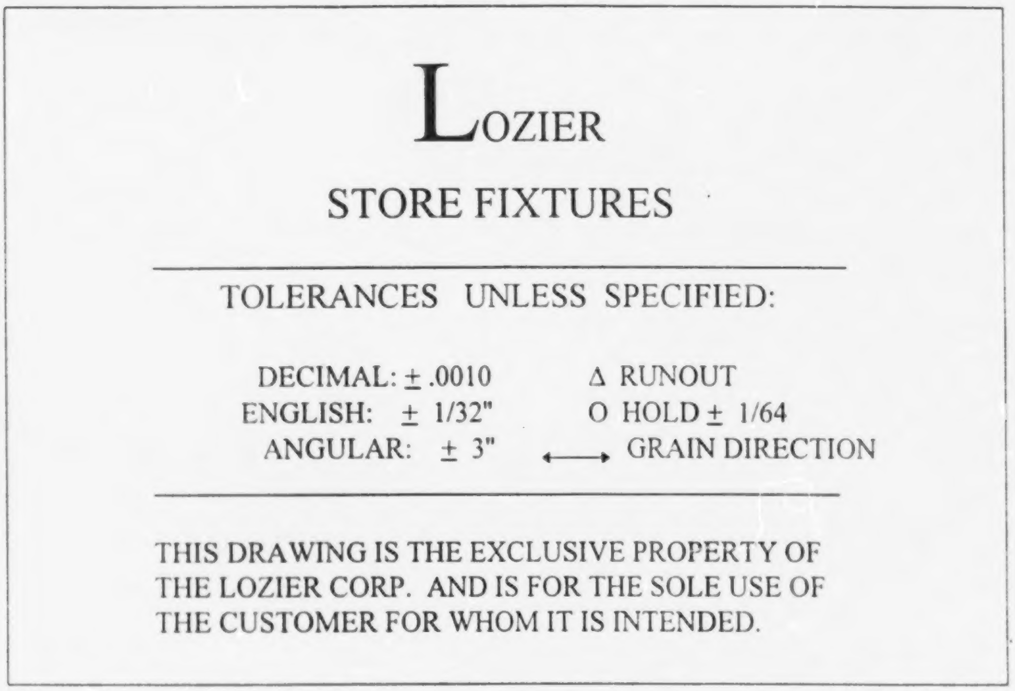


34130-10	G-1	REDRAWN ON AUTOCAD	DEB 11-21-94	DF	RR
15830	G	ITEM 2 WAS 21297-01	BP 5-21-86	BD	
14924	F	ITEM 2, 21297-01 WAS 29297-01	MJ 6-13-85	CT	AB
13697	E	ITEM 2 WAS 21355-01 TO 21297-01	SP 4-28-84	CT	BH
12355	D	REVISED VIEW OF ITEM 2; ITEM 2 P/N WAS 21325-01	CR 3-7-83	KA	
11445	C	21325-01 WAS 21325	HH 10-31-81	PL	
9308	B	10 REF. WAS 5 1/4 REF.	JBL 8-30-78	RJ	
9109	A	REVISED	RC 1-25-77		
PCO	REV	REVISION DESCRIPTION	DFTR	CHKR	APPVD

TITLE:	SUPERSEDES:
ASSEMBLY, BEAM, WIDE SPAN SAMPLE	SUPERSEDED BY:

The **tolerances** that must be maintained are printed near the revision blocks and are usually written in tenths to thousandths. The amount of variation allowed is called the **tolerance**.

Example:



LOZIER

STORE FIXTURES

TOLERANCES UNLESS SPECIFIED:

DECIMAL: ± .0010 Δ RUNOUT
ENGLISH: ± 1/32" O HOLD ± 1/64
ANGULAR: ± 3" ⟷ GRAIN DIRECTION

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Tolerancing

Tolerance is the amount of variation allowed along with the limit of its variation on size. Certain blueprints will have general tolerances and must be applied to all the dimensions on the drawing. General tolerances will be located in the title block.

ACTIVITY

Directions: Use the blueprint drawing provided to answer the following questions.

1. What is the name of the part? ____________________

2. What is the drawing number? ____________________

3. Were there any revisions made? If so how many ? ____________

   ____

4. Are there any notes on the drawing? If so how many? __________

   ____

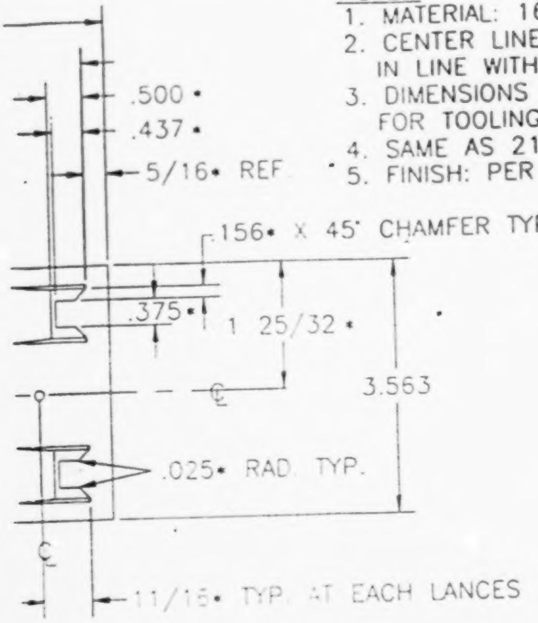
5. What is the date of the latest approved revision? ____________

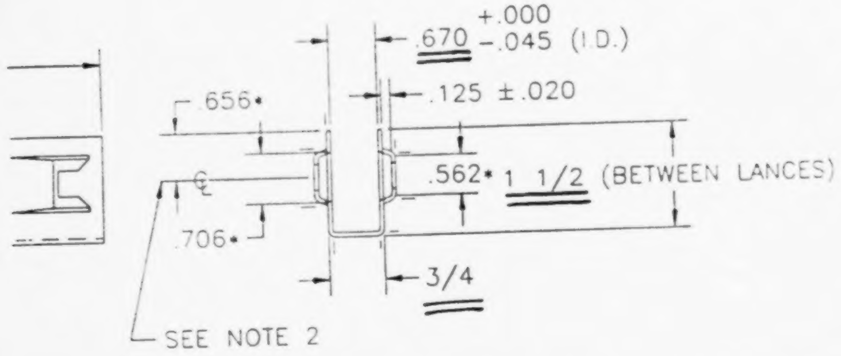
6. What is the length and tolerance for dimension A on drawing S-49750-1?____________________

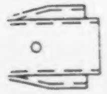
   ____

21055-01 R-
PAGE 1 OF 1 REV

NOTES:
1. MATERIAL: 16 GA. GALV., P/N 63084.
2. CENTER LINES OF LANCES ARE TO BE IN LINE WITHIN ± 1/32.
3. DIMENSIONS MARKED WITH AN "•" ARE FOR TOOLING PURPOSES ONLY.
4. SAME AS 21366 EXCEPT MATERIAL.
5. FINISH: PER ORDER.







15 PAIR	30	-16
9 PAIR	18	-15
78 PAIR	156	-14
30 PAIR	60	-13
24 PAIR	48	-12
96 PAIR	192	-11
90 PAIR	180	-10
84 PAIR	168	-09
NUMBER OF		DWG

72 PAIR	144	-08
66 PAIR	132	-07
60 PAIR	120	-06
54 PAIR	108	-05
48 PAIR	96	-04
42 PAIR	84	-03
36 PAIR	72	-02
18 PAIR	36	-01
NUMBER OF	A	DWG

PCO	REV	REVISION DESCRIPTION	DFTR	CHKR	APPVD
31276-32	R-1	REDRAWN ON AUTOCAD	DEB 5-16-94	OF	

TOZIER STORE FIXTURES

RANCES UNLESS SPECIFIED:
± .010 △ RUNOUT
± 1/32 ○ WELD ± 1/64
± .5 ⟷ GRAIN DIRECTION

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PAGE 1 OF 1

DRAWING NO

TITLE

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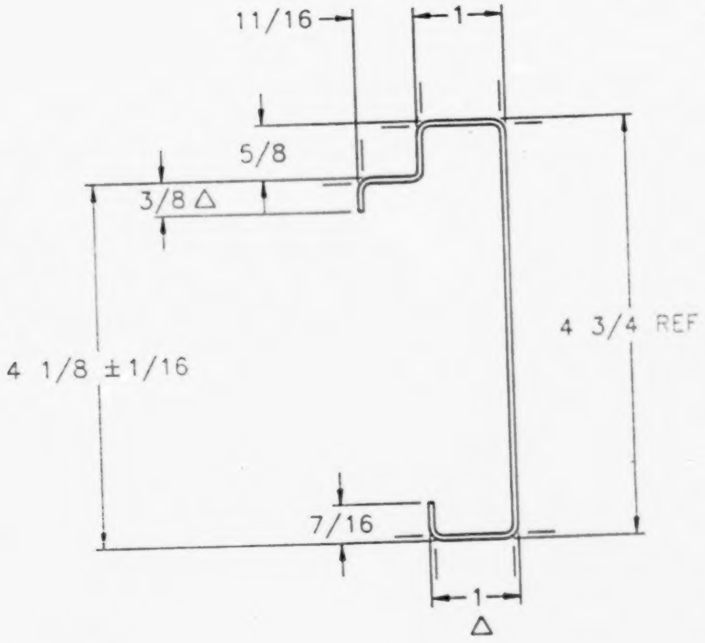
S-49750-1

PAGE 1 OF 1

NOTES:

1. MATERIAL: 16 GA. H.R.S. COILSTOCK (63747).
2. BLANK SIZE: 8 1/4 x "A"
3. FINISH: PER ORDER.



A	DWG NO
11/16	-36
4 3/4	-35
2 1/16	-34
7 5/8	-33
6 1/2	-32
5 1/2	-31
7 3/8	-30
15/16	-29
4 3/4	-28
9 1/2	-27
0 1/2	-26
6 3/8	-25

A	DWG NO
45 11/16	-24
43 3/4	-23
60 1/8	-22
43 3/16	-21
61 3/8	-20
84 3/8	-19
49 3/8	-18
78 3/8	-17
143 11/16	-16
95 11/16	-15
140 3/4	-14
92 3/4	-13

A	DWG NO
63	-12
49 5/32	-11
51 1/8	-10
81 15/16	-9
78 5/8	-8
72 13/16	-7
69 1/2	-6
60 3/8	-5
56 1/2	-4
48 1/4	-3
47 3/8	-2
38 1/4	-1

PCO	REV	REVISION DESCRIPTION	DFTR	CHKR	APPVD
35431	D	MAT'L WAS 14 GA HRS SHEET (63318) OR 14 GA HRS COILSTOCK (63757)	TR 7-18-95	JJ	
	C-3	ADDED -46 55509 NAPA	ARS 7-21-95	DF	JD
	C-2	ADDED -45 55209 PEP BOYS	ARS 7-6-95	DF	RPD
35335	C-1	ADDED -44	TBM 06-19-95	JJ	JD
35226	C	-15, -16, -36 & -41 REF. DIM. "A" WAS XXX 3/4.	CRUZ 06-01-95	JJ	JD
	B-19	ADDED -42 & -43 QT# 54007 NAPA	ARS 5-25-95	DF	JD
	B-18	ADDED -41 QT# 54007	JAK 05-24-95	DF	RPD
	B-17	ADDED -40 QT# 53107 COMPUTER CITY	ARS 2-3-95	DF	JD
	B-16	ADDED -39 QT# 52412 COMPUTER CITY	ARS 2-2-95	DF	JD

LOZIER STORE FIXTURES

TOLERANCES UNLESS SPECIFIED:
ECIMAL: ± .010
ENGLISH: ± 1/32
ANGULAR: ± [illegible]
METRIC: ± 1 MM
△ RUNOUT
○ HOLD ± 1/64
⟷ GRAIN DIRECTION

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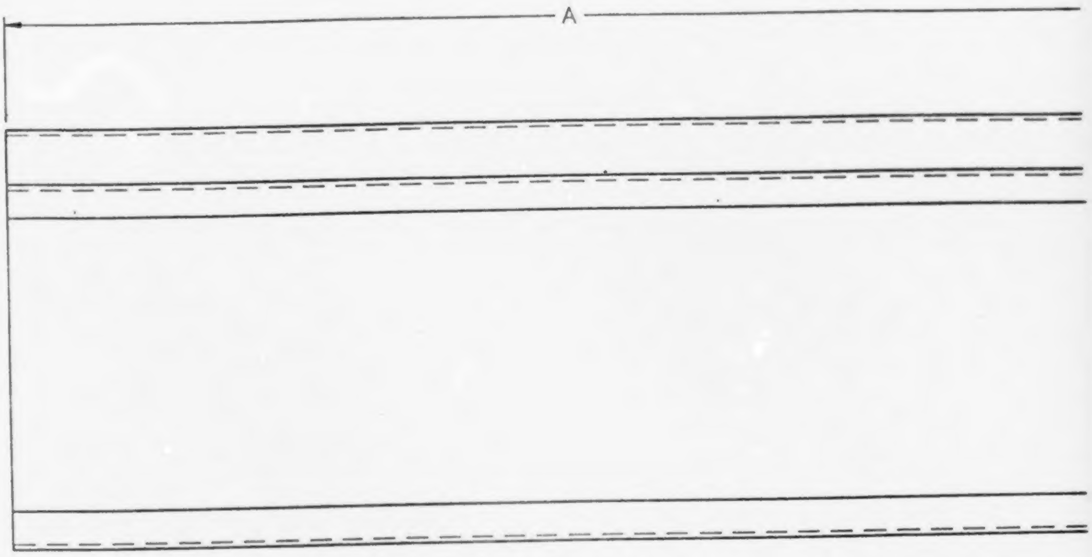

96 1/16	−46
67 3/8	−45
48 7/8	−44
60 1/4	−43
72 1/4	−42
47 11/16	−41
44 1/2	−40
7 1/2	−39
99 5/8	−38
82 5/8	−37
A	DWG NO